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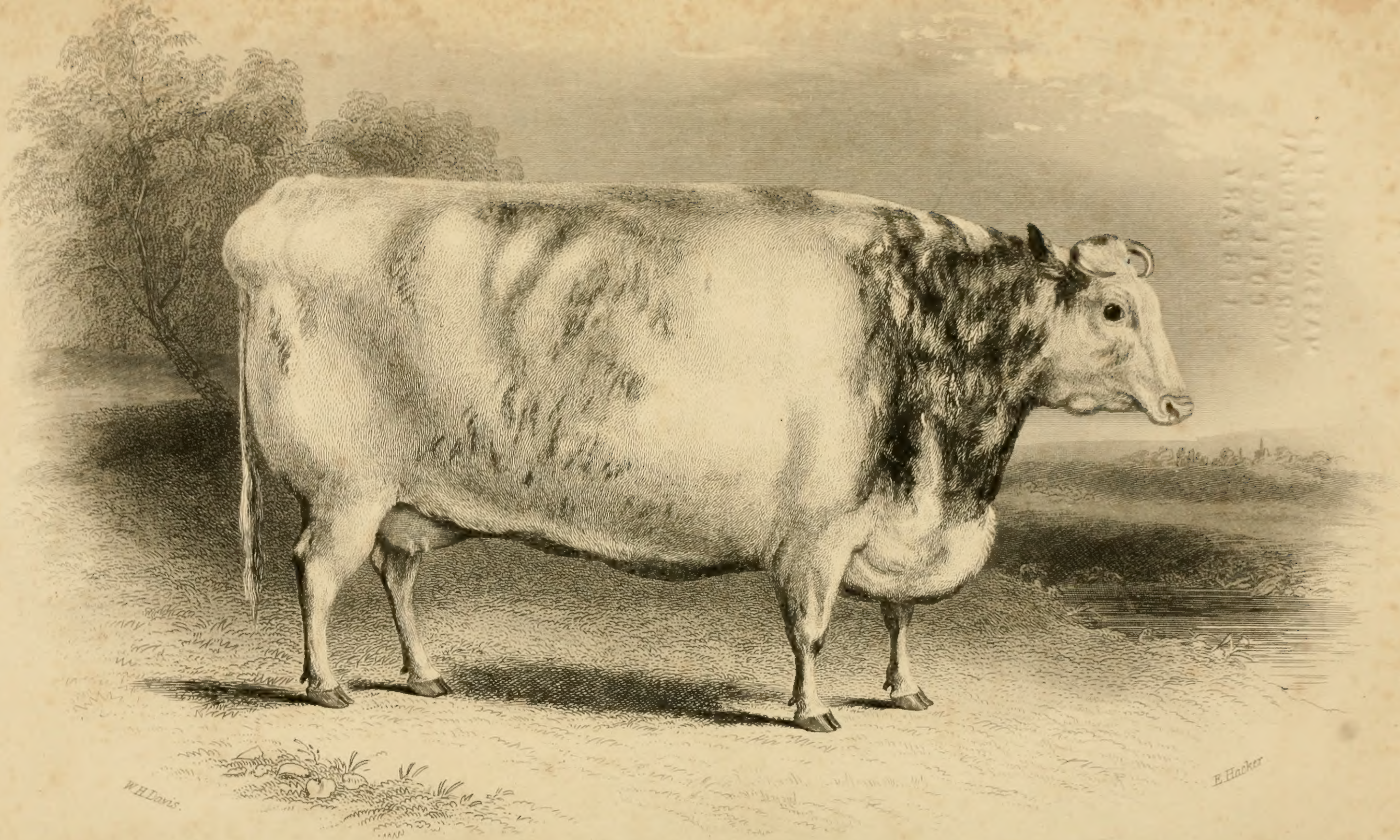

W. H. Davis. E. Hacker

A Short Horned Cow.

The Property of Mr. Richard Hickson, of Hougham, near Grantham, for which the First Prize of £20 and Silver Medal were awarded at the Smithfield Club Cattle Show, Decr. 1849.

London. Published by Joseph Rogerson, 24, Norfolk Street, Strand, 1851.

THE FARMER'S MAGAZINE.

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THE FARMER'S MAGAZINE.

JANUARY, 1851.

No. 1.—Vol. XXIII.] [Second Series.

PLATE I.

A SHORT-HORNED COW,

The property of Mr. Richard Hickson, of Hougham, near Grantham; which obtained the first prize of £20 and the Silver Medal, at the Smithfield Club Cattle Show, in December, 1849.

PLATE II.

THREE SOUTH-DOWN SHEEP,

The property of Mr. William Rigden, of Hove, near Brighton; to which were awarded the first prize of £20 and the Silver Medal, at the Smithfield Club Cattle Show, in December, 1849.

ORGANIC MANURES.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The composition of organic manures is naturally a theme full of interest to the farmer. This great class of fertilizers, indeed, includes most of those which are employed by the cultivators of all times and all countries. It comprehends not only vegetable or green manures, but those of the excreta of animals. It will not have escaped the attention of the observant farmer, how wisely and how benevolently these manures are made by our Creator to promote the labours of the husbandman, while their removal from the farm-yard not only maintains the fertility of the soil, but adds to the health of the inmates of the house, and the live stock of the farm. Considerable enquiry has been excited, and many an instructive series of experiments instituted, as to the mode in which animal and vegetable substances operate as fertilizers, and I propose to devote this paper to the consideration of a portion of this enquiry, purposing to resume the examination at a future period, since the reader will feel that it must be more than one essay that will suffice to trace all that agricultural chemistry has accomplished on this subject during the present century. The review of these discoveries made by the chemist is at once instructive and encouraging. Such a retrospect, in fact, while it teaches us the true foundation on which all our solid knowledge with regard to the enrichment of land rests, at the same time warns us never to be content with the success of any enquiries, but still to regard all our limited acquirements as mere stepping-stones to a still further advance towards a better and more enduring knowledge. As I had occasion to remark in another place on a similar occasion (*Modern Agricultural Improvements, or Supplement to the British Husbandry*, p. 68), the advances which have been made, during the past few years, in the knowledge of the properties and economy of manures, has been, perhaps, more considerable than in any other branch of agriculture. For this very extensive and profitable march, the farmer is mainly indebted to the elaborate researches of the chemist, whose "magic" experiments have, with increasing rapidity, succeeded in presenting to the farmer, on this important head, much that is curious, much that is instructive, and an equally considerable proportion that is profitable to him in his difficult avocations. It has been shown, amongst other important facts, that the ideas entertained by the farmers of a by-gone generation, with regard to the mode in which a fertilizer increases the growth of a plant, were generally incorrect, and not seldom worse than useless, as leading to the adoption of unmeaning attempts and false principles of action. That the food consumed by an animal furnished all the ingredients of which that animal is composed, is a self-evident conclusion, to which the learned physician very readily and at a very early period arrived. He could not, for instance, attribute the origin of the bones of animals to any other source than to the animal and vegetable matters on which they fed —that is, chiefly to the phosphate of lime contained in their daily bread. He found, too, in certain diseases where this salt was ill-supplied to the growing animal, that its bones became soft; his reason, therefore, suggested to him a ready cure. He gave, and with success, to such ricketty patients a supply of either the flour of bone, or ivory dust, or of some other substance in which this essential salt of bones abounds; and this he did because he found that by such treatment the patient assimilated a larger proportion of this "bone earth." The bones, therefore, were hardened—the cure completed. In the same way it was noted that when poultry were confined in situations where they could not obtain access to calcareous matters, that then they laid their eggs without shells. It was found by every house-wife to be a ready cure for this malformation, to give them a supply of the chalk or carbonate of lime, of which these shells are almost entirely composed, and which it is evident they could not *generate* for the purpose. All these things, in the case of animals, was very soon perceived, the cause was reasoned upon; the deficient salt successfully supplied. But it was much longer before men began to apply this chain of reasoning to the wants of cultivated plants, and the deficiency of the soil on which these cultivated crops of the farmer grew. To *them* a different *kind* of reasoning was directed. It was imagined that plants *generated,* as it were, their own ingredients — that is, formed by some unknown process all their earthy and saline ingredients, and of the air which surrounded or the water which nourished them; and although it was in a very early period seen that plants contained a considerable portion of these earthy and saline matters, yet few useful attempts were made to prove to the farmer that these ingredients being furnished by the soil to the plant, so, in consequence, those soils which could not yield them were the "poor soils" of the farmer, and those which could copiously supply them were the "rich soils." Rather than arrive at this practically useful conclusion, all kinds of erroneous or unmeaning reasons were employed. It was said, for instance, that the inferior soils were "too hot," or "too cold;" that the application of manure "cooled" the first and "warmed" the last. No one deemed it more rational to acknowledge that, as the animal procured all the ingredients of which *its* substance was composed from the vegetables which formed its food, so these plants must, in their turn, procure their fixed, that is, earthy or saline materials, from the soil on which they grew, and that when these were exhausted by successive crops then the ground would become less productive, or barren—rather than adopt this very useful conclusion, all kinds of mere verbiage was employed. It was said that the ground was "tired," that it wanted "rest;" and when it was accidently found out that the use of crushed bones was a powerful manure for turnips on the light soils of England; and, further, when it was proved by the chemist that the bones were composed of one-half of their weight of phosphate of lime, and that this was an essential and abounding ingredient in the turnip plant, still few persons attributed the fertilizing properties of the bones to the phosphate of lime. It was to "the grease" of the bones that almost everyone attributed the fertilizing powers of bones. It was allowed, however, by the great and skilful Lincolnshire farmers, who soon extensively used this valuable manure, that the bone-dressed turnips were rather more nourishing than those produced in the ordinary way. The chemist demonstrated that they contained *more* phosphate of lime, as may be seen from the results of the following analysis of the ashes of 100 parts of some Swedish turnips grown in the ordinary way, and manured with guano—a substance in which, like bones, the phosphate of lime forms the chief fixed ingredient. *(Farmers' Almanac,* vol. ii., p. 243).

	Dunged.	Guanoed.
Chloride of potassium..	9·72	6·45
Potash and soda	45·49	36·29
Magnesia	1·23	0·39
Lime	10·17	11·56
Sulphuric acid	17·86	16·86
Phosphoric acid	7·73	19·39

And, finally, it was suggested by the chemist, that if the phosphate of lime could be rendered by any process more soluble—that is, capable of being more easily and rapidly absorbed by the plant—then the power of the salt, if it really does form the chief fertilizing ingredient of the bones, ought to be rendered more rapid. Now this is the very result which the successful modern process of previously mixing sulphuric acid with the bones accomplishes. The super-phosphate of lime which is thus produced being soluble in water, while the phosphate of lime of the bones is not. Still more recently was it suspected by the scientific farmer that in the case of organic manures one great source of their powerful effect must be attributed to the nitrogen they contain. Now, although the fact is not so clearly established as many other principles in agricultural chemistry, yet a few facts which I shall now proceed to notice pretty clearly show that such is the case. The way in which nitrogen is absorbed and assimilated by plants is supposed to be this—viz., that it is derived, by the roots of the plants, from the decomposition of those organic substances of the soil in which nitrogen is contained. When animal substances, for instance, decompose, ammonia is formed. Now 100 parts of ammonia contain of hydrogen 74 and of nitrogen 26 parts; and in support of the conclusion that it is from the decomposition of ammonia that plants chiefly derive their nitrogen, we have the fact that those organic manures which contain the largest proportion of nitrogen are precisely those which produce the most powerful effect; or to use the words of Professor J. F. Johnston (*Elements of Agricultural Chemistry*, p. 170). "Nothing they contain is without its share of influence upon their general effects;" yet the amount of nitrogen present in each affords one of the readiest and most simple tests by which their relative agricultural value, compared with those of vegetable matters, and with each other, can be pretty nearly estimated. In reference to their relative quantities of nitrogen, therefore, they have been arranged in the following order; the number opposite to each representing the weight in pounds which is equivalent to, or would produce the same sensible effect upon the soil as 100 lbs. of farm-yard manure:—

Farm-yard manure	100
Flemish liquid manure	200
Solid excrements of the cow	125
Solid excrements of the horse	73
Liquid excrements of the cow	91
Liquid excrements of the horse	16
Mixed excrements of the cow	98
Mixed excrements of the horse	54
Mixed excrements of the sheep	36
Mixed excrements of the pig	64
Dry flesh	3
Pigeon's dung	5
Liquid blood	15
Dry blood	4
Feathers	3
Cow hair	3
Dry woollen rags	2½

And again, as still further evidence of the close connexion between the amount of nitrogenous matter in plants and the amount of nitrogen contained in the manures with which they are dressed, it was shown by Hermbstadt that the proportion of starch (which does not contain nitrogen) and gluten (which does contain nitrogen) in 100 lbs. of the grain of the same wheat produced on the same soil, differently manured, is as follows. The reader will note how the proportion of gluten present in the wheat increased with the amount of nitrogen contained in the manure.

Manure.	Starch. lbs.	Gluten. lbs.
Blood	41	34
Sheeps' dung	42	33
Horse dung	62	14
Cow dung	62	12
Vegetable manure	66	10

We see, then, that the examination of even the purely organic portion of readily decomposing manures affords us materials for very profitable conclusions. They are, let us not forget, operations of not merely local interest; for they relate to, and explain, processes silently going on in every field and in every farm yard.

DOMESTIC AND CULTURAL ECONOMY.

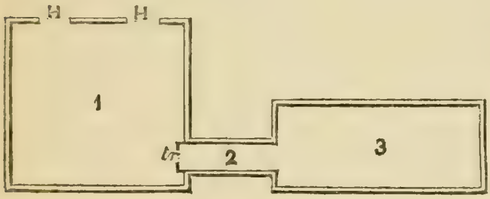
BY J. TOWERS, MEMBER OF THE ROYAL SOCIETIES OF AGRICULTURE AND HORTICULTURE.

No. IX.

In the preceding eight articles upon this subject, founded upon my own experience in four counties, since the year 1819, I have attempted to embrace every point, theoretical or practical, which could lead to the profitable cultivation of so much land as would enable the occupier to supply the household, and any animals which it might, from its extent, be able to support, with well-grown nutritious vegetables. Thus it has been shown that perfect drainage, deep comminution, and seasonably repeated laboration of the soil, constitute the foundation of successful tillage.

It has fortunately happened, during the course of the last half year, that a vast discovery has been made, whereby the capacity of some soils to retain the nutritive elements of all manures has been determined; and thus I have been enabled to lay before the readers some of the leading facts elicited by these discoveries. Before proceeding any further with the application of cultural principles, it seems proper to allude to an economical practice, which has recurred to memory within the few past hours, and promises, if judiciously adopted, to become a source of profitable amusement.

In the Isle of Thanet, where the coast from the North Foreland to the Sandwich river consists of one entire belt of chalk cliffs, I found that many of the residents had taken advantage of this rock to keep rabbits, with very little trouble, and by a method which completely avoided the nuisances that inevitably result from the use of *hutches.* In 1819 I found ready constructed, on a small property in the parish of St. Peter's, an apparatus of first-rate availability, and which never failed us during the three years that we remained in Thanet. It consisted of two pits, which I will endeavour to describe.



No. 1 was a square pit, 4 feet wide in the clear, so deep that the bottom should be 3 or 4 feet in the body of the chalk rock *below* the level of the subsoil, which in the locality consisted of a fine brick earth, or red sandy loam. This pit was secured on every side with a 9-inch wall of the capital red bricks of the island, except at places marked *h h,* which were two openings left to permit the rabbits to burrow into the chalk ; and another marked *tr,* an opening and channel (2) to the pit 3, but fitted with a fall-down trap board, acting through a frame grooved on each side. 3 was the feeding pit, bricked on each side and at the *bottom,* as was also that of No. 1. The feeding pit measured about 5 feet by 3 in the clear, and was employed for a two-fold purpose : the green food (such as the leaves of common cabbage and coleworts, not those of the cauliflower or broccoli, and occasionally the sow-thistle) was regularly, but in moderation, thrown into it, and the dry food (as bran and a few oats) let down in a wooden trough by means of a slender pole of sufficient length to the brick pavement. The trap-door which closed the entrance passage was in general kept up by means of a string, looped at the top, and thus the rabbits were familiarized to this department. Each of the pits was finished off with a strong wooden *curb,* secured at the top of the four walls ; and upon that a cover of strong oiled canvass was fixed by hinges, to keep the pits dry, the edges of the canvas overlapping the curbs. The passage 2 was merely an arch, which was filled up with earth to the ground level.

If I have rendered the construction of this artificial warren sufficiently intelligible, it only remains to add that in our premises it was situated in a yard close to the back of the dwelling, which formed one of its sides, and consequently was immediately approachable. The rabbits evidently burrowed in the chalk, as we could discover from the fragments which they scraped into the pit through the two openings *h h.* We found, I believe, at our arrival in the winter three brown does and one buck, to which stock no more were added, nor was any change attempted during the three seasons following. Broods of young ones were produced in sufficient numbers ; and from these, when large enough, we selected for the house one or more, by fixing a long twine to the loop by which the trap board was suspended, and held at a distance and out of sight of the rabbits while they are feeding: due precautions being observed, the trap was released, and thus the animals that were within No 3 were detained.

Great advantage results from the position of the pits, the deep chalk rock of the coast preventing the possibility of escape, while its texture permitted the rabbits to form their burrows horizontally, without much difficulty. I attempted to construct a pair of pits on my property on Maidenhead Common, where there was partially a good deal of shaly chalk and a surface soil above it, somewhat resembling that at Thanet; but the rabbits became unhealthy, and never produced a brood : in fact, I am persuaded that a solid, continuous chalk rock, and the absence of a gravelly stratum, are indispensable conditions. It will be advisable to keep the rabbits short of food for a few hours previous to using the trap, and then to throw a few tempting leaves into the pits, omitting for a time the dry, trough food.

While on the subject of bricked excavations, I may mention the great utility of well-constructed rain-water tanks in country domiciles. I found one such in the same yard, and within a short distance of the rabbit warren : it consisted of a square excavation, six or seven feet deep, nearly cubical in its form and dimensions, the brickwork laid in and effectually coated with Parker's cement ; the top arched over except in the centre, where a broad flat stone was placed to serve as a man-hole. This tank, furnished with a common lift pump, supplied rain-water to the house at all times. In gardens, where there is not a pond or rill of soft water, a rain-water tank, capable of holding two or three thousand gallons, is a very important appendage, and should never be dispensed with. In Berkshire I had one constructed close to an angle of the house, and being made by a labourer who understood brickwork, it was completed at an inconsiderable outlay. The rain-water from roofs ought to be filtered through a vessel containing a foot of clean gravel pebbles, and over them a six-inch layer of coarsely-bruised charcoal, covered with river-ballast, before it enters the tank.

THE JERUSALEM ARTICHOKE.

The object of a fallow is twofold, viz., the eradication of weeds, and the preparation of a supply of the food of plants in a state that it can be assimilated and taken up by succeeding crops. To attain this object, a "naked fallow" was formerly the almost universal practice; but now it is more customary, in ordinary land, to raise green crops, returning the great bulk of the produce to the soil as manure. The benefit, it is argued, to the soil from the action of the atmosphere, and the opportunity to rid the ground of weeds, is in this last case not diminished, and an additional element of advantage is introduced in the action of the roots and leaves of living plants, exercising, as they do, their own distinct and peculiar powers of extracting and assimilating food (both) from the soil (and the atmosphere) for their own support in life, and for subsequent plants in their decay. The plants themselves in the meantime support many head of live stock.

The principle on which this practice is grounded is in itself (and I do not enter on the question of the relative profit of the two systems) obviously correct. For the object of a "fallow" being (cæteris paribus) to obtain a store of mineral food accessible to the roots of plants out of the *inexhaustible but slowly-rendered supplies of the soil*, the setting any second power to work is a manifest gain. Hence the larger the green crop, and the more nutritive its character, the greater the benefit to the crop succeeding; in other words, the more manure the larger the grain crop.

Many persons, not satisfied with the result of green crops fed-off, go a step further: *they remove the produce* of the fallow crop *altogether*—looking upon the green crop as "enough of a fallow," even though the produce be carried off; and the principle on which they consider they may do this, without in their haste making "bad speed," is that while the plants of the root crop are so disposed as to allow the ground to be constantly worked (*i.e.* fallowed), the bulk of the mineral ingredients constituting their food are not those which form the principal food of the cereals. Thus, while the latter require in large quantities the phosphates, alkalies, and silica, the root crop requires only a large quantity of the alkalies, and little or none of the phosphates or silica. But though it is true that the root crop consumes few phosphates, and little or no silica, and though on certain soils and situations it may actually answer to follow this practice, just as in other cases it may be best to have a bare fallow, yet the argument is, when reduced to practice, fallacious. For it is evident, not only that the alkalies are as necessary to the cereals as their other principal constituents, but that indirect injury to the cereal is just in the same ratio with the direct value of the crop preceding. Those root crops, we know, most interfere with the cereals, which are in themselves most nutritive; inasmuch as they are the more nutritive as they more nearly approach the cereals in character. Again, the heavier the green crop the more there is taken away; and though, quantity for quantity, the root crops contain so few mineral ingredients that the injury would be nominal, yet, in practice, all containing a large proportion of the alkalies, and counting in gross produce tons for bushels, they are really most exhausting. Thus we have constant opportunities of noticing, where wheat follows potatoes, that after a heavy crop of the latter the wheat crop is invariably deficient. The ground has been heavily manured, is in good tilth, and there has been every opportunity for working (or fallowing) the ground; but the atmosphere has not had sufficient "time" to release the necessary alkalies, and the wheat crop feels the loss. The same is well-known by many able farmers to be the result (though here there are not so many opportunities of observing the effect) when other root crops are removed. All are severally injurious in proportion to their "quality and quantity." The farmer who seeks at once to have and remove a valuable crop without exhausting his land, is seeking a contradiction; as the old English adage expresses it, "He would like to eat his pudding, and have it."

But this is not the principle on which "we grow green crops instead of a naked fallow," where our object is, by the combined agency of the atmosphere and of the vital powers of growing plants, to collect and prepare an abundant store of food for a more important grain crop, and, at the same time, to obtain a sound nutritious food for our stock. The mineral ingredients of the soil are inexhaustible: if we had "time" (which we have not in ordinary soils without ruining ourselves) to fallow our ground long enough to enable the atmosphere to release the ingredients of the soil for the use of plants, we should need no manure. We employ then the agency of plants, in addition to the exposing the soil to the action of the atmosphere and the employment of manure, to extract food for a higher class of plants. Thus we "gain time," and find there is an excess of food, with which we can support our cattle. Thus, with us who restore the crop, the more energetic the plant grown, and the heavier and more nutritive the crop, the better for present purposes and the grain crop succeeding. In fact, our object is not to grow plants dissimilar to the cereals, *i.e.* containing little nutriment, and bearing little likeness to the higher class of plants, but just the reverse. We do not prefer the turnip to the swede, but the swede to the turnip.

I make these remarks in introducing the Jerusalem artichoke to public notice in this country, because it is a common idea that (even when we return the crop) we are not to look at what mineral ingredients a plant is able to collect for the use of its successor, but on the smallness of its own consumption—that we are not to look on what it gains, but on the small amount it expends—that, in a word, just in proportion as any plant is nutritive, and has a direct positive value, so its indirect value is lessened; and thus the very value of the Helianth might at first stand in the way of its popularity.

Having made these remarks, let me now point out the value of this plant as compared with other roots now cultivated, and its peculiar advantages. I believe it can be fairly shown that it is most easy of cultivation, suited to the most extensive range of soil, most enriching when returned to the land, produces the most valuable crop, and is generally in fact one of the best plants for field cultivation and the feeding of stock that can be grown.

In nutriment it would appear to be equal, *quantity* for *quantity*, with the potato. Its constituent parts are so nearly identical, that there would be a greater difference between two varieties of the potato, or between two specimens of the same variety grown in two different descriptions of soil, than between the potato and artichoke grown on the same soil. Boussingault found in 100 parts, dried in vacuo at 110 degrees—*

	With the Ashes.					Without the Ashes.			
	Carbon.	Hydrogen.	Oxygen.	Nitrogen.	Ashes.	Carbon.	Hydrogen.	Oxy gen.	Nitrogen.
Potatoes	44.0	5.8	44.7	1.5	4.0	45.9	6.1	46.4	1.6
Helianthus tuberosus............	43.3	5.8	43.3	1.6	6.0	46.0	6.2	46.1	1.7

In the composition of the ashes of 100 parts—

	Carbonic Acid.	Sulphuric Acid.	Phosphoric Acid.	Chlorine.	Magnesia.	Lime.	Potash.	Soda.	Silica.	Oxide of Iron and Alumina.	Coal water and Loss.
Potatoes	13.4	7.1	11.3	2.7	5.4	1.8	51.5	trace	5.6	0.5	0.7
Helianthus tuberosus	11.0	2.2	10.5	1.6	1.8	2.3	44.5	trace	13.0	5.2	7.6

In practice I have tried several experiments, and find the same results; my experience proving to me that 1 cwt. of artichokes will produce in pigs of a fair quality fully 6lbs. of flesh (equal at present prices to 2s. 3d. money), which is the full value of the potato.† The experience of others also, who have grown them, confirms my estimate. In nutritive qualities, therefore, the Jerusalem artichoke stands in the highest class of vegetables: but *equal* to the potato in *quality*, its relative *quantity* is as

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* Boussingault, Economie Rurale, page 327.

† I have, as is my practice in feeding with potatoes and all roots, mixed a small quantity of meal with the artichokes, deducting the value of the meal in pounds of flesh. Thus, for 7s. 6d. worth of meal I deduct 20lbs. of flesh from the gross weight: this gives the value of the artichoke or other root employed. I use tail corn of the poorest description in my experiments.

four to one. I this year grew potatoes and artichokes together in two different fields—the one an old lea recently broken up without manure, and the other a worn-out sandy marl, to which no manure has been applied for many years. Neither of the fields have borne potatoes for many years past. In both cases I gave the potatoes and artichokes exactly the same treatment, and in both cases the crop of artichokes was fourfold that of the potatoes. The potatoes in the one case were Fortyfolds, in the other Shaws and Regents. In both cases the potatoes had the best side of the field. The *produce of the artichoke* is therefore easily calculated. If the potato produces in ordinary field cultivation from two to eight tons per acre, the artichoke will produce from eight to thirty-two tons per acre.

Again, "Its long-keeping qualities" recommend it. Here it supplies a desideratum. The period during which roots are of most value is during the months of March and April, throughout which we cannot depend on keeping even our swedes and beet—when at best their keeping is a doubtful and difficult matter, and one in which we are often disappointed; and when, if we on the whole succeed, there is still great waste through their vegetating, and from the invariably large portion of decayed roots. Now the Jerusalem artichoke will keep sound and good, I will engage to say, long after even the white beet has perished. I have known the Jerusalem artichoke in the month of April as hard as a ball, and that under circumstances where our best keeping potatoes would have vegetated and become soft. It is in itself a good keeper, and moreover has this advantage, that it can be taken up as late as the swede. It is ripe in November.

Another point in favour of the artichoke is the ease and certainty with which it is cultivated. There is, indeed, no root cultivated so easily and certainly. The potato, so subject to disease as not to be risked on a large scale for the feed of stock; the beet, swede, carrot, and parsnip, either bad seeders or subject to the fly; the artichoke comes up almost to a plant, and regardless alike of frost, drought, or fly, goes "straight a-head." So much indeed does it surpass these plants in the point of easy cultivation, that I believe that it would average from this circumstance alone much heavier crops even in gross bulk than any of them, even on their own ground; and though one root, the parsnip, might in very favourable circumstances come into competition with it, yet this valuable root is so difficult of cultivation, requires a soil in such fine heart and order—a soil so rich, deep, friable, and clean—that these favourable circumstances would not occur one time in a hundred; and in ordinary field culture it would stand no comparison with the Helianthus whatever. The parsnip is, in fact, not a field plant, properly speaking; and thus it is that in actual practice it never appears in farm cultivation. In ordinary practice we cannot *succeed* with it.

Again, the Jerusalem artichoke is most deserving of the farmer's attention on account of the *great range of soils on which it can be successfully cultivated.* The best soil for this, as for almost every cultivated plant, is of course a good, deep, friable loam. But the artichoke, by the aid of the colossal apparatus with which it is provided for obtaining sustenance for its ponderous roots and gigantic stems, at once collects a great amount of food even from the niggardly sand, and enforces abundant contributions from the sturdy but congenial clay; while, to the state of the land, *be it ever so foul,* it is utterly indifferent. If the weeds are kept down till the plants are from two to three feet high—*i. e.,* if two good hoeings are given—no weed of any description will appear again: *there is no trace of vegetable life beneath its shade.*

Now these are points, as it appears to me, of great consideration. To those farmers who have *heavy clay lands,* where the beet or turnip tribe would for obvious reasons be out of the question, and where anything but a bare fallow would have been utterly impracticable, they would appear to be of peculiar importance; the more especially when one other point is mentioned, viz., that not only do the stems of the Helianth when burnt return as much (or rather more) mineral food as that extracted by the tubers, but afford fuel for burning a very considerable portion of the clay itself. There is, moreover, no question as to its *thriving* even in the heaviest clays. There is a notion, I am aware, that the only land on which the potato *and* artichoke can be grown is light land. It is a mistake. The potato, indeed, cannot be grown advantageously on strong clays: because its tubers cannot make their way in such soils. But both the potato and artichoke are potash plants, and contain a great amount of mineral ingredients generally; and in those cases where the soil is sufficiently friable from burning or other causes, the stronger the land the heavier crop, even of potatoes: while the artichoke (requiring the very same ingredients, and possessed of extraordinary powers for forcing its way and obtaining itself food and room) is actually capable of being cultivated in such soils with advantage in ordinary practice; *i. e.,* in heavy lands, in their ordinary state. *In all soils* it is a *most enriching* crop, from the vast amount of nutritive produce returnable as manure, and from the ashes of its stems. In heavy soils, where its produce will be the largest, and where burning is of such great use, I conceive its importance can hardly be estimated.

In fine, the Jerusalem artichoke*, easy of cultivation, embracing an unlimited range of soils, thriving at once on poor sands and capable of cultivation with singular success on heavy clays; producing on the average the heaviest crop in gross bulk, and double the amount of dry nutritive matter per acre of any known vegetable capable of being kept in store; larger even than potatoes; and, finally, enriching the soil on which it is grown to an extraordinary degree by the rich return in manure, and the burnt ashes of its stems or burnt soil—it is, to all appearance, the most valuable root for the purposes of "fallow" and "stock feeding" that has ever been introduced into this country. Floreat Helianthus tuberosus! J. R.

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* There is a prejudice against the Jerusalem artichoke from its being generally supposed that it cannot be completely raised; that it is, in fact, a perennial weed. If allowed to remain on the same spot of ground for six or seven years (as is the practice in gardens), or even for two years, some difficulty of this sort may arise; but if planted in rows and raised every year, there is no more difficulty in raising the Jerusalem artichoke than the potato. And if any tubers capable of vegetating *should* be left in the ground (which after burning the soil is not likely) they are easily pulled up when they appear in the spring; just as easily, indeed, as self-sown potatoes. And if this is thought too much trouble; they have, it should be borne in mind, made an ample return, by destroying in the preceding season every perennial weed in the soil. They are cultivated in the same manner in every respect as late potatoes. Any inquiries addressed to J. R., at the office of the *Mark Lane Express,* will be cheerfully answered.

CAN STEAM POWER BE SUCCESSFULLY EMPLOYED IN AGRICULTURE?

BY M. M. M.

At a period when men's minds are directed, with the most painful anxiety, to the sources from whence they are to expect assistance in times of difficulty and trial, the question of a more general adoption of steam, and its substitution for animal power, is pressing with considerable anxiety upon men of all grades. A farmer looking over his annual accounts finds the item *labour* to be the largest, perhaps, in his ledger; and hence, if he can seriously and extensively diminish this source of outlay, he may be able in some measure to compensate himself for the reduced receipts for the produce of his farm. Now, there are two modes of accomplishing this object—either by diminishing the quantity, or producing the same effect by an improved quality; and as the former generally returns upon his own head with redoubled injury, and inflicts loss and failure in its train as a natural and necessary consequent, the question at once becomes one of improving the quality of the labour, or reducing the cost of its performance.

If, then, the several items of labour, such as wages, task-work, &c., be carefully examined, a very large item will appear in team labour. Much as the expense of keeping these animals is generally kept from the farmer's view, from the fact of the produce of the farm being employed instead of absolutely purchased food, still, if accounts are accurately kept, the annual debit of farm horses, how cheaply soever they may be kept, will be from £23 to £25 per annum; but, if labour and attendance be charged, the cost can never come one fraction below the last named sum. Hence, on a farm requiring six horses, an item of £150 per annum immediately rises up, irrespective of wear and tear, interest of capital, and liability to accidents and loss. More accurately stated, the cost per annum will be—

	£	s.	d.
Six horses' keep, at £25 per annum each	150	0	0
Interest of first cost—say £30 each, or £180—at 5 per cent................	8	0	0
Depreciation 10 per cent. on value....	16	0	0
Farrier's and blacksmith's bills	1	15	0
Insurance from loss, or annual sum to lay by to re-purchase animals which will die off.....................	12	0	0
	£187	15	0

Here a sum very nearly approaching to two hundred pounds a year is involved in a team of six horses only; and therefore, if this item could be dealt with, it would be one involving a very material sum; and, if the whole arable land, and the whole of the farm horses necessary to its cultivation, were taken, if M'Culloch, Colquhoun, &c., are correct as to the number of horses employed in agriculture—viz. 1,200,000 in England and Wales—and if our estimate of, say £31 expense annually, be at all correct, then we have the enormous cost of horses employed in farming annually, of £37,200,000 in England and Wales!

Nor is it the cost alone—the consumption of food which might sustain human beings; but the objections to animal power are so great that, if a more regular, dependable, and untiring agent could be employed, the facilities of production would be almost inconceivably increased. Thus, horses require rest; inanimate motive power requires none: horses must cease to work while feeding, not so mere mechanical power: one may be sick or disabled so that no skill can spur it up to a given effort; the other can always, if out of order, be repaired by its original maker: so that the constancy, the regularity, the readiness, the willingness of adaptation to the end desired, is a facility always possessed by mere inanimate over the very finest and best form of animal muscle.

But, beyond this, inanimate motive power can accomplish what no earthly amount of animal could accomplish. Had animal power been applied to raise the Britannia Tubular Bridge, it could not have been accomplished by all the horses in the kingdom, aided by all the armies of Europe, and yet a small mechanical apparatus effects the whole with the facility of child's play. Wind power, and water power—cheap and useful in their way—have now given way to the more potent agent steam, and this has transformed all the puny efforts of the past century into lilliputian insignificance. It has rescued the whole bulk of the population in this country from road-travelling; dislodged, by its economy and speed, the coach, the post chaise, the stage waggon, the horse; nay, it has defied, by its cheapness and rapidity, even the humble pedestrian to compete with its untiring and lightning-like energies.

In the process of manufacture it has shown its ability, not only in the power and speed it collects and distributes, but in the mathematical accuracy with which it performs, as by talismanic agency, the most delicate, refined, and difficult operations, and is a perfect automaton in performing what skilful hands once had difficulty in executing, and with this amazing difference—that the one was accomplished in a fanciful and varied manner, sometimes better and sometimes worse; but the steam-engine performs the whole with an accuracy perfectly mathematical.

But it is not to one operation alone that this wonderful fund of power is confined. It can not only in one mill turn a lathe, and in another weave a stocking—in one hammer circular bars of iron, and in another dress a piece of broad-cloth; but the same steam-engine can, by the machinery which it drives in the same building, if necessary, hammer, and cut, and file, and turn; can spin, and weave, and dress; can, in fact, take the raw material at one end of a building, and, by one single original motion, feed itself with coke and water which itself pumps up, move the machine which takes in the wool, transfer it to the other machines necessary for its manufacture, and bring it out broad-cloth ready for the tailor. Of such a power as this why may not the agriculturist avail himself to carry on his multifarious operations? Why may he not thrash, and grind, and plough, and sow, and roll, and harrow, and mow, and stack, by a power which accomplishes for the manufacturer processes by far more difficult?

As regards thrashing the problem is solved. The scores and hundreds of thrashing machines driven by steam in the Lothians and in Lincolnshire have settled the question for ever, for the ablest and most practical men have been able to make use of them with the greatest advantage and success, and have, by them, been able to reduce farming more to a manufacturing process, by the work they were able to effect. A single steam-engine not unfrequently performs the following operations: Thrashes the corn; winnows it, and, if barley, faulters or cuts off the "awns;" sacks the corn, and removes the sacks when the requisite weight is deposited; removes the straw to a distant part of the buildings; chops it for the use of the animals, or for litter; slices the turnips; breaks the cake for the stock and for the mill; and, with the waste steam, often cooks for the cattle or the swine. If necessary, also, sawing timber, crushing bones, &c., can be performed by the same engine, with proper machinery; so that the other operations it is capable of performing reduces materially the amount it is necessary to place to the debits of the operations strictly of an agricultural character.

The cost of working expenses of steam power, in farming, for thrashing, will of course materially depend upon the price of coals. The cost will vary from £180 to £250, and the expense of fuel will vary from 2d. to 5d. per hour for say a six-horse fixed machine. It ought to thrash five quarters of wheat, or seven or eight quarters of barley, per hour. It will be observed we have not taken credit for the machinery necessary for carrying out all these operations, because they are clearly independent of all kinds of motive power.

	£	s.	d.
But, assuming the steam-engine, boiler, fixing shaft, masonry, &c., to cost the maximum sum, say ..	250	0	0
Then add thrashing machine, with gear attached, necessary to thrash and dress corn, as we have before described	65	0	0
One chaff cutter, and its necessary gearing	18	18	0
Turnip slicer and cake breaker	10	10	0
Mill, gear, &c, if added	60	0	0
	£404	8	0

Here the great draws on the horse labour of the farmstead is effected by an outlay of £400. The following may be taken as the work of a six-horse power fixed steam-engine, attached to the thrashing machine.

The duration of the day is taken at eight hours. This is a short day; but, as the time required for getting up steam, clearing away, and all the delays necessarily attending all kinds of machinery, consume more or less time, it is fairest to take it at this length.

The quantity of grain thrashed will be at an average of five quarters per hour—40 quarters of wheat.

	£	s.	d.
The cost will be 8 cwt. of coals, at 9s. per ton	0	3	7
Engine man	0	3	0
Oil, &c.	0	0	6
Wear and tear of engine	0	1	6
Interest of capital of engine and machine (£315), at 10 per cent.	0	2	0
Seven labourers, at 1s. 6d. per day each	0	10	6
Six women or boys at 9d.	0	4	6
	£1	5	7

or little more than one penny per bushel. Now, to thrash this same quantity by hand would cost, at the very least, 4d. per bushel—though it would be difficult to obtain the thrashing of it at that price; so that, in 40 quarters of corn, here is a clear saving of ten shillings, or threepence per bushel. It may doubtless be urged with great truth that, as the steam-engine cannot be working every day, it is fair to charge more than the interest of cost of one day upon each day's thrashing; but it must be borne in mind that, if the engine is not performing the thrashing part of its duties, it is driving some other kind of machinery, and its saving as a mill to the farmer may be greater even than its saving as a mover of the thrashing machine. For instance, it will grind on days when not thrashing, say—

				£	s.	d.
Sixty bushels of corn; this, at 5d. per bushel, will amount to				1	5	0
The cost will be—	£	s.	d.			
Engine man, who can also attend the mill	0	3	0			
Coals, 10 cwt. at 9s. per ton	0	4	6			
Oil, &c.	0	0	6			
Interest of £300—the cost of steam-engine and mill—at 10 per cent., say	0	2	0			
				0	10	0
Saved by steam-power, in addition to cartage to and from the mill				£0	15	0

It must be conceded, however, in all fairness, that very much of the policy or impolicy of using a steam-engine depends on the ability of the farmer to keep it constantly employed—or so constantly, at least, as to prevent it from rusting—or to have it but a small part of the year useless. This evidently points out that it is only for large farms that a fixed steam-engine can be useful; for the quantity of corn it is capable of thrashing should bear some relation to the quantity the farm produces, unless the time and power of the engine can be exerted in some other profitable manner.

There is, however, this main difficulty, and such it is—if steam power be applied to no other agricultural operations but thrashing and its connected operations, it will dispense with little of the horse labour of the farm. A certain staff of horses must be employed to cultivate the arable land, to cart up the produce, and convey the manure; and hence, if the steam-engine is working, it is an extra element of outlay, an extra source of cost, an extra means of providing for out of the profits of the farm, and, while the steam-engine is at work, the horses are standing idly in the stable. Two kinds of replies are made to this objection: the one, that some reduction may be made in the teams by the substitution of steam thrashing; and the other, that on a well managed farm, there is always work enough for horses to do, even in winter, without the horse-power thrashing machine. In the first remark we think there is reason; and it is possible, when a steam-engine is in full work, that a pair of horses in five or six pairs may possibly be dispensed with. But so many of the hands of a farm are ordinarily employed during the busy days, when the steam thrashing machine is at work, that there are seldom hands sufficient to work the horses and steam thrashing machine as well; and hence, on thrashing days, the horses are too often idle in the stable. Nor will a day of rest ever do harm. It may be as politic, as wise, as economical to allow the draught horses to have their holidays now and then, as it is to give men recreation and cessation from labour; and perhaps some little diminution of high keeping may be made in the horses where a steam-engine is employed, for winter is a period when, if horses are hard worked, they require a course of feeding which is very costly. Still it must be admitted, that while, if the steam-engine could entirely displace the horse labour of the farm, it must be an incalculable saving—as a six-horse engine, capable of doing 8 or 10 horses' work, could perform all the operations of farming and dispense with the horses altogether, it would save perhaps one-half of the cost of the motive power employed on the farms—yet it has so far been able to displace but a part, and left the remainder untouched; so that the figures on paper hardly represent the real saving of steam thrashing, and that apparent saving *is not all profit.*

Ploughing by steam, however, seems to be the ultimatum of all efforts at applying that power successfully to agriculture; and it appears to be the *summum bonum* of the agriculturist's desires, who wishes to see high practice prevail in the application of skill to the operations of farming. And it is not without reason that this is given as a sort of test; because, if the steam-engine can be successfully employed to propel the plough, there is no doubt but every other operation may be performed by that wonderful machine. The two great impediments to steam ploughing are—the necessity for a difficulty of turning at the ends of the fields; and the almost impossibility of obtaining a road in a tillage field capable to sustaining the weight of a steam-engine required to perform the necessary operations or to embody the requisite power. To those who see hundreds of tons propelled on our railroads with the velocity of lightning, it only seems necessary to apply the motive impulse in the direction of *power* instead of *speed,* and almost any difficulty could be accomplished; but if we reflect the cost there is incurred before the very *road* on which the steam-engine has to travel can be brought successfully to play, it ceases to be a wonder that it has not been put in practice on our arable lands, for the weight would sink it over head in a very short space of time. On this subject, one of the best agricultural mechanists of the day, Mr. Allan Ransome, says—"Those who are best acquainted with modern progress in every branch of science will be the last to pronounce an opinion as to the extent to which improvements may be carried on, or to say that even ploughing fields by a steam-engine is chimerical; on the ground, however, that to know the difficulties to be incurred is the first step to success, we would merely state a few facts that may serve to correct the judgment, as well as to moderate expectations some may have formed. The mode of drawing ploughs by locomotive engines, on the same plan that railroad carriages are drawn, does not offer a prospect of success, as the most powerful railroad engine would not even move itself upon an arable field, from the enormous weight of the machinery causing the wheels to sink into the ground; nor do we think that, in the present state of mechanism, it is possible to construct a steam-engine of a sufficiently light weight to be allowed to go over the surface to be cultivated."

Without further pursuing his remarks in the same strain, all tending to discourage the effort, from a man a great admirer of agricultural advancement, and a great improver himself, we may say that, if he saw even a faint glimmer of hope, the enthusiastic character of his genius would have induced him to hold out at least the beacon of hope, and to endeavour to encourage future adventurers to pursue a path calculated to bring about results so desirable.

The attempt of Mr. Heathcote—made, we think, under the direction of the then little known, but now celebrated, Josiah Parkes, and of which we have heard hardly anything since the period of its first trial—could not be called anything more than a magnificent and costly failure. The principle attempted was for the engine to proceed in a line either in the centre of a field, if it were large, or in the headland if it were smaller; and as it was being propelled along, to have ploughs diverging at right angles from it right and left, and working over a pulley placed at the sides of the field most distant from the steam engine. The weight of the engine was attempted to be overcome by a carriage or self-laying railroad—so that as it proceeded it passed over a sort of endless band. The regulator, the attendance at all the ploughs, pulleys, &c., and the entire trouble and cost of the process were such, that the project was, if not given up, at least so placed in abeyance, and so isolated, as to cease to be observed or commented upon, and we fear the awful expense might be said to be almost all thrown away.

An attempt has subsequently been made, on paper at least, by Mr. Blurton, of Uttoxeter, to prove that it was neither necessary to have an engine of great weight, nor to lay down any road for it, nor was it needful to have the ploughs proceeding at right angles with it, but to use it on the principle of the reaping machines, and propel the ploughs before the engine. He insists that as a double plough requires a power of 694lbs. only, at the rate of 2½ miles per hour, the power is completely under the control of the agriculturist. Now we have no hesitation in saying that a power equivalent to from 324 to 372 lbs. will be fully adequate to propel an ordinarily well-made plough; and if so, six times that power will propel a set of six, and so on in proportion. He then urged that a power to propel the ploughs would operate as effectively behind as before them, on the principle that the reaping machines are propelled in Scotland. He then proposed to increase the power of the steam-engine: by decreasing its speed, say from 2½ to one-fifth or half a mile per hour, five double ploughs may be propelled by the same power as propels two. He proposed that four double ploughs should be so arranged that two of them should turn the furrows in the usual method towards the right hand and the centre of the land, and the two other ploughs having their turn-furrows placed reversewise should turn the furrows to the left hand, also towards the same centre of the land—so that these, propelled forward by the engine, would make a four-bout land at one action. The wheels of the engine were to be exactly the size of this four-bout land, and the furrows so left solid and compact at the bottom should serve the purpose for the wheels, so that the whole power of the engine possibly available should be applied to the ploughs. An acre, he contended, would thus be ploughed in two hours; but the great difficulty which his plan did not provide against, and which we fear it would not obviate, was the turning at the ends—how the four ploughs, the machinery necessary for their action, and, above all, how the ponderous engine was to be persuaded to turn round her bulky and ill-formed body for such a process, he has left to be explained, and practice, we fear, will always present obstacles too serious to his project for it ever to be carried out successfully.

The most recent trial we have had of steam power as applied to the plough is that of Lord Willoughby de Eresby, who from the experiments made has published his description of the plan adopted, and augurs well of it for being a successful mode of carrying out the application of steam to the propulsion of the plough. And if it can be successfully carried out in ever so isolated a case—if on flat level land only, and if even confined to large fields—still one single case, we say, of really successful steam-ploughing may have its parallel, and be of use to the community, even if it has but a very few imitators, because it will establish the possibility of a practical principle. This engine, like the rest, is a locomotive, and weighs as much as three tons and a-half, and is of 26 horse power. It was manufactured, we believe, specially for his lordship, and designed by Mr. Gooch, the locomotive superintendent of, we think, the London and North Western Railway. This moves on a portable railway, and the ploughs advance and recede on either side of it at right angles, precisely as in the case of Mr. Heathcote's engine, and are followed by as many subsoil ploughs, so that both operations are performed at once. This is a manifest improvement upon all previous trials we have heard of; for the preparations and provisions, for so wonderful a machine, are so complicated and serious, that it is desirable to do all we can with it when once located on a spot; and if there is one process more than another calculated for the application of steam, it is the process of subsoil ploughing. It is always in strong soils a process so distressing to the horses —so fearful an expenditure of animal power, that all farmers feel it a real practical difficulty; and it is just one of those operations which the steady application of adequate power, without strain or drawback, will accomplish triumphantly.

These four ploughs, and their accompanying subsoilers, are placed on a frame which is furnished with a platform, on which a man stands to direct the movements of the ploughs, &c.; and these are attached, in the case of the first trial, to a chain one hundred and fifty yards long. The chain is an endless one, and admits of the ploughs and their machine being detached at pleasure. At the extreme part of the field the chain is attached to the ground by an anchor riding over a pulley, and the ploughs having completed four furrows ride back empty, so that the engine is alternately working four idle ploughs returning on one side, and four working ploughs advancing on the other. When four furrows are thus completed, the steam-engine moves three feet forward, and a similar process proceeds. In cases where, from irregularity of fences, &c., the distance the ploughs have to travel is diminished, the chain can be shortened by forty feet, and the speed at which the ploughs travel is something like five miles per hour.

As to the saving of labour, Lord Willoughby de Eresby calculates that it will complete the work ordinarily done by thirty-two horses—which is equivalent to sixteen ploughs and as many holders —and the quantity of turnip land which may be expected to be ploughed in a summer day, may be taken at 30 acres. To accomplish this, his lordship calculates that eight men are sufficient to manage the engine—one horse to cart the water to the boiler; and, therefore, he contends, that there is a saving of 30 horses and 8 men. To set against this last item is the interest, at 10 per cent., on the cost of the engine, which was about £450 or £500, and therefore three shillings per day must be reckoned, and five shillings per day will, his lordship states, be found adequate for coals. Now if this includes all the outlay—all the preparation— the refitting and the packing up, so to speak, of the materials—and all the cost, and delay, and labour, attending the temporary railway; still there would be the finishing of the headlands, and places where the engine had run—there would be the poaching of carting the water, coals, &c., and several incidentals, which no prudence nor foresight could remedy nor prevent. We fear, moreover, that there would be found so many days when the engine could not be in use, that the interest of first cost must extend beyond its mere working days, and the cost of coals will materially vary in different districts; but we must confess our doubts that it will be found to answer, and for this simple reason —that it does not obviate the great difficulty attending all steam ploughing—remove the friction of the conveyance of the motive power itself over the land—nor obviate the difficulties attending the turning of the ploughs, &c. There is also obvious loss in the one half of the ploughs and men being always idle. We do not see any necessity for this, because one of Lowcock's one-way ploughs would obviate this, and some turning machinery could be easily adapted by the agricultural mechanists of the day, without the slightest difficulty.

The remarks of scientific men on the recent trial, when traction and forces are so much better and more generally understood than when Mr. Heathcote's was first launched, seem all to tend to the point that there must be an invention of a new mechanical power—or rather a new mode of applying forces to the cultivation of the land, if it is to be accomplished by the agency of steam.

The plough is a *wedge,* which turns over the land horizontally slice by slice—it *presses* the sides and subsoil, and on strong soils defeats rather than aids pulverization, especially in some states of the land. Now a spade is a *lever,* and its operation is to raise the earth—exactly the opposite; the one a *horizontal* traction, the other a *perpendicular* force. Now all scientific men agree that it is more likely that a new perpendicular force can be applied to the soil than a horizontal one: the one may be directly under the engine, and hence it may be light; the other must be at a great distance, and hence there will be the large waste of power inseparable from these circumstances. The same power is now suggested for the cutting of drains; and we think something like what we once saw exhibited—a "spade plough"—may some day be invented to obviate the difficulty.

Might not some engine be invented which would not only lift the soil, but whose waste steam should make an instantaneous fallow? This is a mere suggestion, but time may carry it into practice.

We have dilated on the question of ploughing because once apply the steam engine successfully to this, and we know not to what farm process it may not be carried. Get it to move over an arable field without sinking—get it to turn and twist at the will of the engineer, and the plough, the subsoil, the drag, the scarifier, the harrow, nay the cart and the waggon—may be propelled to carry the corn, and distribute the manure, and drill the grain, and cut the harvest, and the whole process of farming resolves itself into a mechanical process.

To taunt the farmer with less disposition to avail himself of the advantages of machinery than the manufacturer, may have weight with those who little understand the relative difficulties of the two cases. The one has his power shielded by a roof, not occupying perhaps a rood of land; the other spreads it over hundreds of acres; and the greater the holding and capital of a man, the further are his operations removed from the source of the power that moves them, if it be a permanent and fixed steam-engine, and we so far at least know of no mode of transmitting power to so great a distance as to be available to his far-off operations. Hence locomotive power has to be used where there can be no railroad, and with our present knowledge this must always be a difficulty.

It is, we imagine, for another age, if it ever be done, to apply steam successfully to agriculture generally. To barn and farm-yard processes it may be done; but in the fields there are at present insuperable difficulties.

Sowerby, Nov. 23, 1850.

MR. RIGDEN'S FARMING.

Our paper on the management of Mr. Rigden's farm appears to have excited considerable attention not only from the contemporary press, by whom it was extensively copied, but at last, it appears, also from Mr. Rigden himself, who is so kind as to offer some explanatory remarks, which will be found considerably to modify any opinion which, without them, might be formed as to the extent of his profits, and which we should have been glad to have printed had they been forwarded to us. The following is the letter:—

"TO THE EDITOR OF THE SUSSEX AGRICULTURAL EXPRESS.

"SIR,—It was not my intention to have again alluded to the report of Mr. Milne of a visit to my farm; but having seen some calculations of the results of my farming in the *Economist,* and the *Farmer's Magazine,* the conclusions to which they have arrived are so erroneous, and, as I believe, calculated to operate so prejudicially to my brother farmers, that I am induced to ask the favour of your giving insertion to a further explanation.

"In the *Farmer's Magazine,* under the head of 'Peculiarities of the Management of Farms,' and which is extracted from the *Gardeners' and Farmers' Journal,* the writer has multiplied the number of acres I occupy by nine, and deducting the sum under the head of yearly expenditure, has arrived at the conclusion that I have gained a profit of £1,521. I can only say that I wish I could find it so.

"The error into which the writer has fallen is, that he has not taken into account the cost of horse-keep. The number of horses I keep, including riding-horses, milk-cart horses, and colts, is thirty-six, and sometimes I have had forty. The item of seed-accounts is entirely for seed for green crops, such as tares, clover seed, sainfoin, lucerne, turnips, &c., and does not include any *seed corn*, so that the following addition must be made to the yearly expenditure :—

Keep of 36 horses, at £20 each	£720
80 qrs. of seed wheat, at 44s.......	176
Seed barley, 20 qrs., at 40s.........	30
Oats, 40 qrs., at 18s.	36
	£962

making a sum of nearly £1,000 which has not been taken into account. There are also several items in my expenditure that do not appear in that statement. Among others I may mention that I expend nearly £100 a-year on oil-cake; but for the sake of those who are curious about the subject, I will state that supposing I sold *all* the produce of my farm, and purchased again what I require for my seed, corn, horse-keep, &c., my yearly expenditure would not fall far short of £6,000; and if they will then multiply the number of acres I occupy by nine, and deduct the expenses, they will be somewhat nearer to the profit I realised when wheat and barley were some 20 per cent. higher than they are now.

"I very much regret that the publication of this report should have rendered it necessary that I should offer these explanations, but I have the greatest repugnance to being held up as an example to follow, feeling as I do that many of my neighbours have far greater claims to this distinction than myself. "WILLIAM RIGDEN.

"*Hove, Nov. 9th,* 1850."

Now we have no reason whatever to complain of Mr. Rigden's letter; nay, it confirms precisely our own view, which was, that the profit was so "*enormously large*," as we expressed it, that it could only be accounted for by assuming that he was "quite out of comparison with the ordinary run of farmers"; and now it appears that we were quite right in our assumptions, and that this enormous profit melts down at one fell swoop by nearly £1000, and is also subject to further deductions, as we shall see hereafter.

Mr. Rigden speaks of the error into which we have fallen, and says that it is that we have not taken into account the cost of horse-keep. We beg his pardon, we took exactly into account what he was pleased to give us, through Mr. Milne, at page 7 of the pamphlet.* No other data, not one more element of calculation is afforded, but the "yearly expenditure" is given at £4,529, exactly what we made it appear.

Now, either this statement was true or it was not. If it were true, we can have committed no error; if it were not, Mr. Rigden has himself to blame for deceiving Mr. Milne and the Berwickshire Farmers' Club—however unintentionally—as to the entire character of his "yearly expenditure," by £1000. Why give *it at all* if not give it fully and in its entirety?

Every practical man will see that neither Mr. Milne, the members of the Berwickshire Farmers' Club, nor ourselves, could know instinctively that horse-keep was left out. We could not tell but his horses were kept out of the produce of the farm, which was not entered in the head of yearly receipts; and therefore if errors and gross errors are published as to his profits, he has himself to blame.

But any impartial reader will see that we could not consistently have committed the error of adding —without one reason or one fact to sustain us— the horse-keep to his list of yearly expenditure. He distinctly tells us—we imagine the words are his own, for Mr. Milne gives them in detail—that the horses are fed on "hay, Belgian carrots, oats, wheat-chaff, and pea-haulm: *they consume all the oats grown on the farm.*" Now Mr. Rigden gives in his "yearly receipts," which he says does not represent the full amount of produce actually raised, as besides what is sold, much is consumed on the farm. Why not debit yearly expenditure with this, and credit "yearly receipts," if a fair estimate of Mr. Rigden's profits are to be given to the public?

Another cause of complaint is, that we have given the "seed" at £150: this he says is only the seed of his green crops, and not seed *corn*. Could we certainly divine that it had this limitation, or are we to be blamed for the omissions of the writer?

Mr. Rigden has given us another cue. He has told us that if all his produce were sold, and all purchased again, his expenses would swell even to nearly £6,000. Now, assuming we are correct as to his produce, and he does not deny it, we have the following results :—

£9 per acre on his farm is....	£6,050
Outlay	6,000
Balance	£50

Now Mr. Rigden employs £1,200 capital on his farm: it ought to pay ten per cent., but call it five, this will be £60 per annum; so that without reckoning wear and tear, and the other items enumerated in our previous paper, the farm is carried on at a dead loss! We fear English farming will suffer by this in the estimation of our northern friends. It is a "heavy blow and a great discouragement" to this example at least of "high farming."

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* "Report of a Visit to the Farms of Mr. Rigden, Sussex; Rev. Mr. Huxtable, Dorset; and Mr. Morton, Gloucestershire: with Remarks on Agricultural Improvement." By D. Milne, Esq. Read at a meeting of the East Berwickshire Farmers' Club. Berwick. 1850.

We find no fault with that gentleman, however. We feel obliged to him for his letter, which has cleared up the difficulties we saw and expressed as to the balance-sheet as it was; and we hope that the newspapers which copied our previous remarks will be so obliging as to copy these also, that Mr. Rigden's own explanation may go as far as the erroneous results were circulated.

We know not whether the Berwickshire Farmers' Club will again entertain the question; but we are sure if they do, they will think, that situated as Mr. Rigden is as to modes of disposing of his produce, and his great outlay being considered, that the encouragements to pursuing his system of farming are by no means very great.

And if the £10 loss per annum applies to a period when "wheat and barley were some 20 per cent. higher than they are now," what the present LOSS of Mr. Rigden's farming will be we are afraid to conjecture! We beg to express our obligation, as journalists, for the additional light Mr. Rigden has thrown on the subject.—Gardeners' and Farmers' Journal.

ECONOMY OF FOOD.

SIR,—Two papers of considerable importance on this subject appear to have much escaped the attention of agricultural periodicals; although the subject itself is of vital interest to the depressed and oppressed agriculture of the country.

Whilst the corn grower is unable to compete with the foreigner, we need some articles of culture for food less liable to competition, and not less nutritive and palatable. The green crops, which well suit our climate, produce more nourishment per acre, and are protected by the greater proportionate cost of freight and perishableness on ship-board, suffer under other difficulties. The *precious* potato (however despised) is still subject to the putrid disease; the turnip is too juicy and soft for human food, alone; and in that objection all the other largely-grown edible roots and greens more or less participate. And the conversion of these into beef and mutton, taking an average of 150lbs. to make 1lb. of flesh, is a waste, regarding both as human food, which must limit its practice in a densely-peopled country.

The papers in question do not directly meet this dilemma, but they appear to establish two principles, which expand the restriction of our choice of agricultural plants and of the modes of their preparation for food, by considerations at present overlooked or disallowed.

1. The first relates to the incorrectness of nitrogen as a measure of nutritive power in different articles of food.

2. The second, to the increase of nourishing power of the same food, by presenting it to the digestive organs in different conditions.

The first of these papers was read at the British Association, entitled "On the per-centage of Nitrogen as an index to the nutritive value of food," by Dr. A. Voelker. This goes to show the inaccuracy of the rule, inferred from Liebig's analogy between the vegetable and animal proteine compounds, that "the nutritive (or rather the fleshening and strengthening) property of food is proportionate to the nitrogen it contains." So generally has this rule been received that in several of the recent tables of the comparative value of food the proportion of nitrogen has been taken as the basis, or even as a correction of actual experiments, in feeding; and the cultivation of different plants has been recommended according to their relative contents of this ingredient. But Dr. Voelker shows that in many cases much of this nitrogen is not in the composition of proteine (the fleshening principle), and contributes little or nothing to the formation of flesh. The discussion which followed also went to infer that there was yet much to be learned respecting the assimilation of nitrogen, and the relation of food to the formation of the blood (and consequently to nutrition). Under these circumstances, agricultural improvers will for the present not be restricted by the proportion of nitrogen as a guide to practical feeding, but will put more trust in their established tables, esteeming Liebig's above-quoted analogy, for occasional reference and reasoning, whilst the further progress of chemical (as well as practical) investigation are rendering it a surer guide to their broad acres; and productive plants, at present rejected for deficiency in nitrogen, may be found valuable in mixture, or even alone.

The most comprehensive table of reference for this purpose that I have met with, is given by the Rev. M. J. Berkely, in the *Agricultural Gazette (Gardeners' Chronicle)*, 1845, p. 649; where the theoretical nutritive power, computed by Boussingault from the nitrogen, of no less than 76 plants, and parts of plants, cultivated for food, &c., is given; in contrast with 16 other tables, drawn from practice and experiment. The republication of that table, with an additional column for that compiled by the Rev. W. Rham, would be very appropriate to the suggestions from this paper of Dr. Voelker.

The other paper goes a step further; it is entitled "Alimentary Regimen," by M. Gasparin, read before the French Academy of Science, and unnoticed in any other English publication that I have met with, than *Chambers's Edinburgh Journal*. It relates chiefly to the diet of working-people: and establishes a remarkable difference in the strengthening power of the same material (bread) according to the mode in which it is presented to the digestive organs.

He finds that the mining population about Charleroi (on the border of Belgium) nourish themselves fully, preserve health and great vigour of muscular strength, upon a diet with less than half the nutritive principles found requisite for hard-working men in the rest of Europe. The distinction appears to be the habitual

USE OF COFFEE

at every meal. Their coffee is a very weak infusion of equal parts coffee and chicory, with about one-tenth milk. Of this the miner takes about four pints daily; and little or no other drink. His food is white bread and butter, with a supper of potatoes and greens. He eats 2lbs. of bread, 2oz. of butter, and 1½lb. mixed potatoes and greens daily; and uses 1oz. each of the coffee and chicory. No meat except Sundays and feast days; when he also drinks four pints of beer. This is less in nutritive quality than the diet of the monks of La Trappe, or of the prisoners in the French jails: and yet these Belgian miners are *energetic* workmen; so that the French miners, with a much more nutritious diet, are quite unable to compete with them.

This efficacy of the coffee is not attributable to the nourishment contained in itself, which is very small; but indirectly to its co-operation with the other food; or to its action on the vital organs of digestion and secretion.

M. Gasparin also instances the efficacy of coffee, in enabling soldiers and others to endure fatigue; and adds that the miner with his wife and six children, lives on 1s. 7d. a day, without getting in debt.

Coffee then, though very little nourishing in itself, seems to deserve more attention than it receives, as an article of diet and economy, for its influence on other articles of nourishment. Coffee we cannot grow in this climate; though we get it abundantly from our colonies; but the other ingredient, chicory, (or succory) grows wild in this country; is of easy cultivation, a heavy bearer, stands the frost; the leaves are an excellent and early fodder, and no contemptible dish for the table, and the root not only mixes well with coffee, but when fresh roasted forms a very respectable substitute for it. After long keeping, roasted and ground, it gets flat; but the root may be kept dry; and baked, weekly, in a pretty quick farm or cottage oven, brown all through like coffee; not black. (For this it is best cut up, not larger than hazel nuts.) And it is full as likely to increase the nourishing and strengthening power of other vegetable food as of bread and potatoes. Even our succulent roots, as turnips, carrots, &c., mashed or grated, and boiled or baked with meal of any kind, may be made as solid as desired, to substitute for, and improve on, the precious potato; or may be mixed, when dressed and hot, with chopped or crumbled bread, to pretty near the same purpose; and with this drink of chicory (for coffee) might make a hearty working diet, very cheap and chiefly home grown, even whilst potatoes are dear.

But this paper of M. Gasparin's, we may hope, is only the enunciation of a *principle*, capable of much wider application than merely to coffee and succory for drink, and bread, and greens or our present grown roots for food; extending to the feeding of other animals as well as man, in suggesting improvements in the cooked and uncooked mixtures for that purpose. The converse is curiously illustrated in the case of carnivorous animals, which M. Majendie found to require as much weight of dried meat as of meat in its raw state; though the latter is at least ⅞ths water *i. e.* 1lb. will contain only 2oz. of dry: so great is the effect of its state of preparation for the stomach.

These two papers then, taken together, seem to prove that the nutritive power does not depend upon the elementary ingredients of the food only; but is much affected by their state of natural composition in the plant, and may be still further influenced by artificial adaptation to the digestive organs; thus opening suggestions for more effective and consequently more general employment of our home products; cheaper and heartier feeding for our own labourers; and more economical production of animal food. J. PRIDEAUX.
—Mark Lane Express.

DESTRUCTION OF WIRE-WORM.

A correspondent writes as follows:—"My attention has just been directed to a short paragraph in the present number of the *Farmer's Magazine*, from a correspondent, asking where and how rape-cake should be applied for destroying the wire-worm. With your permission, therefore, and for the further information of your readers, I beg to say that, if the rape-cake be applied during the wheat crop, the best way is to drill it in, tolerably deep between the rows, in March, as recommended by the late Earl of Leicester, for the application of rape-dust to wheat as a top-dressing. The month of March is the best time for the operation, as the worm is then resuming its depredations, after lying in its winter's torpid state.

"If the cake be applied during the barley or oat crop, it should be drilled in with the seed.

"It may be well to add that, if the season should be a dry one, it is possible some disappointment may be felt as to the effect which the cake may have as a *fertilizer* on the crops; but the drier the season is, the more certainly will it produce the desired result on the wire-worm; for the longer the lumps of cake remain undissolved by wet, the longer can the worm revel to its own destruction.

"I think it further right again to remind those who purpose trying the plan to be very particular in having the cake in *lumps*, and not in dust. In fact, it is very desirable that as little of the dust of the cake as possible should be allowed to remain in what is intended to be used for this particular object. The reason for having it in lumps was given in the original communication."

BURTON-ON-TRENT FARMERS' CLUB.

A meeting of the club was held on Tuesday, the 17th Oct, 1850, at which were present the President, Thomas Gisborne, Esq., and a few of the most zealous members. The attendance, however, was not so numerous as usual. The subject of discussion was introduced by Mr. Lyon, who read the following paper:—

I have to offer to your notice such suggestions as have occurred to me, "on Summer soiling with grass or green crops, and on the circumstances which determine the profitableness of the practice." When I accepted the engagement to set down what experience or inquiry from others had taught me on the subject, I proposed to myself to make a few experiments with a view to attain more certain data on which to found an opinion as to the profitableness of summer soiling. Several circumstances, however, occurred to prevent my doing as I had proposed; and the consequence is that I have rather to state what questions appear to me unsettled, than to attempt to settle them. Our president remarked at the last meeting, that reasonings without experiments were not of great value; I fully agree in that remark; but yet one province of reasoning, and by no means its least useful one, is to show us what experiments are wanted to clear up doubts on practical points of agriculture. It is said, that a proper and pertinent question is half-way to knowledge. I am afraid that I may not be even so far on my way to a knowledge of the advantages or disadvantages of summer soiling; still I hope to be at least able to show you what inquiries are necessary, before we can judge with any precision whether the advantages prevail over the disadvantages. I have seen many statements published by farmers who have adopted the plan of summer soiling. Some say it is most profitable; others that it is unprofitable; but I have met with none which gave me any certain proof that it was either one or the other. I think the time is come when we, as farmers, must endeavour to know things ourselves, and not trust implicitly either to the practice of our fathers, or to the authority of the scientific innovators, who seem to think that whatever is new must be right, and whatever is old wrong. If we go a step farther than severe arithmetic guides us, we are pretty sure to go wrong in every economical question; and I don't think that farmers have yet got the habit of accurate calculation which is necessary to a successful progress towards new methods of practice. I don't at all wonder that the practice of summer soiling has not become general or fashionable until lately, for there was one circumstance which would effectually prevent its being advantageous before science had taken agriculture by the hand. In bringing produce out of the field to consume, the manure is brought away which is to serve for future crops; and, according to the old systems of managing manure, not half of what was brought away was really returned to the land; so much escaped by drainage of soluble parts, and by evaporation of the gaseous parts of the manure. We are certainly now in a condition to summer soil with more hope of success, because we know how necessary it is to preserve every particle of the fertilizing substance in the manure.

Before I enter on the merits of the practice of summer soiling, let me just remark that we are not to compare a good and skilful system of soiling with a slovenly and imperfect system of grazing; but we must compare the merits of the two when each is carried out in the best manner. We all know that a field of old pasture, new rye grass, or new clover, &c., may be grazed in a very unprofitable manner. Say that on a pasture you let sheep nibble out the crown of the grass all winter, and eat it close all spring and summer. A pasture so treated will not yield as much produce by one-half as it will when the grass is not eaten in the winter, and is suffered to stand in the spring until the grass is six or eight inches high, is then eaten off and suffered to rest until the grass again attains a similar height. Grass of two inches high will not increase so much in a week's growth, as grass of three inches high; and up to a certain point the bulk it adds for a given time of growth, is greater the higher it is. The same fact is still more apparent in clover, and rye grass, and other plants that are used as green food.

There is a remarkable experiment in the work of Von Thaër, which goes to prove the immense increase of bulk yielded by clover when cut at long intervals. I think it of much importance that similar experiments should be made under various circumstances on other grasses and herbs; and I am sorry I have not been able to add my mite towards the elucidation of the point. In the subsequent part of these remarks I shall have occasion to show that this question of the comparative produce of plants at various periods of their growth, has a most important bearing on the practical part of my subject. The plants which would commonly be used for summer soiling in our district, would be the following; the grasses of old pastures, new layers of clover or of rye-grass, &c., and vetches; others may be used, but it is not necessary to the purpose of my present remarks to mention any others. What we want to ascertain is, whether it be profitable to consume any of them by summer soiling? and whether, under certain circumstances, each may not sometimes be so consumed to a profit? You will see that I do not enter into the question whether it be profitable to grow certain green crops; but merely inquire when we have certain crops, what is the best way of consuming them. Yet if it should appear that by summer soiling, a much greater profit was yielded by a green crop, that would be a reason, among others, for growing it more frequently. Mr. Huxtable and others endeavour to persuade us that we may make green crops profitable; but I rather incline to the opinions which Mr. Greaves advanced in his paper read at our last meeting.

I will first speak of summer soiling with grass mown from old pastures; and in doing this I must assume certain data as to the quality of the land, its yearly produce, and its rent and payments. I will take these to be about what Mr. Greaves assumed in his paper; I suppose that land at 45s. an acre of rent and other payments, will yield in the whole year produce equal to the keep of a full grown beast for twenty weeks. The care of fences, ditches, &c., and the share of general expenses of the farm and labour employed in attending stock, I take to be 15s. per acre. We have thus twenty weeks keep of a beast for £3. I assume that the beast will return for its keep £4 10s.; and the profit to the farmer will thus be 30s. per acre, which reckoning the capital employed at £10 per acre, gives a profit of 15 per cent. That seems to me a tolerably correct estimate of what grass land will do when grazed properly.

Now suppose that we summer-soil the same acre, and that its produce and the return of beasts for it are neither more nor less than when it was grazed, the following would be about the difference made in the farmer's profit. In grazing, all the manure made by the crop is applied to the land without any labour; but in soiling, all the manure would have to be carried from the yard back to the field. The produce would of course have to be carried from the field to the yard or shed. I suppose the average distance of the field from the yards to be one-fourth of a mile. I suppose, too, that the grass is mown twice, and that each mowing yields of green grass 5 tons, which is equal to 25 cwt. of hay. The whole produce would thus be 10 tons; and I believe I am not far wrong in stating that the manure would be about three-fourths the weight. The expenses in labour would be as follows; for I reckon that it would take a man's labour for every 30 beasts, merely to give them their food and take care of them when the food was delivered at the yard. A labourer's wages being 10s. per week, each beast would cost 4d. a-week.

	£	s.	d.
Mowing twice, at 3s. per acre	0	6	0
Carting home 10 tons, at 6d. per ton ..	0	5	0
Carting back 7 tons manure, at 6d.....	0	3	6
20 weeks' care of beast, at 4d.........	0	6	8
	£1	1	2

I believe you will agree with me that I have put down these expenses at less than they would be in practice; for I have assumed that all the labour would be done in the most economical and skilful way. Now even on this calculation, the farmer's profit would be reduced from 30s. to 8s. 10d.; but I believe few people would prevent its being reduced to nothing, by an unskilful employment of the necessary labour.

The first show of the case, therefore, is very decidedly against summer soiling, when compared with grazing. But are there advantages in the practice which will compensate these expenses? It is manifest that only in two ways can compensation be made. Either the beasts must return more for a given amount of produce when soiled in sheds; or the produce of the land must be greatly increased.

I believe it is the general opinion that stock will return more, during the summer season, both of fat and milk, when running free in pastures than when tied up in sheds. Some people tell us that the advantage is on the side of sheds, because the cattle escape the annoyance of insects and the accidents of rain, &c. I cannot but think that the health of cattle must be better in the fields, and that with the same food they will do better there.

I consider, therefore, that the compensation—if indeed compensation there be—must come from an augmentation of the actual produce in grass by mowing instead of grazing. Suppose that the produce of a grass field is augmented one-third, the expenses would of course be somewhat increased, but I calculate that the farmer's profit would be pretty much the same as when the field was grazed.

	£	s.	d.
Mowing twice 1-third heavier crop	0	6	6
Carting home 12½ tons, at 6d.	0	6	3
Carting back 9 tons manure, at 6d.....	0	4	6
Attendance on beasts 26½ weeks, at 4d.	0	8	10
Expenses of soiling..........	1	6	1
Rent, &c., as before	3	0	0
	4	6	1
Cr. 26½ weeks' keep of a beast, at 4s. 6d.	5	19	3
Leaving a profit of..........	£1	13	2

on an acre, or rather more than was gained by grazing. I think, however, in practice it would take at least an addition of one-half to the crop to make the profit of soiling grass equal to that of pasturing; for besides that the labour cannot be expended so economically as I have set down, we must bear in mind that additional stock to eat the larger bulk of food would require additional capital to be used, which should pay the same rate of profit.

I must say that I hardly see how it is possible to obtain from grass land this necessary augmentation of its produce. For to what circumstances must the increase be owing? I assume that in grazing you allow the grass to grow to a certain length before pasturing it. Can we then by suffering it to grow beyond that length get the difference in produce? or do cattle in grazing waste a large proportion of the produce? If the grass be of the same length, I see no difference between cutting by the scythe or by the cow's mouth. But it is evident that when the grass is very high a greater portion is wasted by the treading of the cattle and by their dung. Turn cattle into a field where the grass is six or seven inches high, and they will eat it up very well; little is lost. But if the grass be a foot or fourteen inches high, enormous waste is made. I take it, therefore, that it is to luxuriant crops that the practice of soiling is applicable.

I will now speak of clover, or rye-grass. If we suppose the yield of these crops to be the same as old grass, then what I have said of grass will apply equally to them. But let us suppose that by higher farming we increase the produce of seeds to double what unimproved grass will yield, it may in that case be profitable to soil them rather than to pasture them. I imagine that there is a certain length beyond which it is not advantageous to let herbage grow. You know that the longer you let a hay crop stand, the longer it is before the lattermath springs; and it is questionable whether in many cases we do not lose in one way what we gain in another. Very likely if we were to mow a pasture every time it arrived at eight inches of height, we might get a larger amount of produce in the year than by suffering it to stand until it began to seed. But then we know that where meadow land is highly manured, you may get four or five mowings each of a foot high, while on an ordinary pasture a single mowing is not recovered before the end of the autumn. Now it may be that six or seven inches is the most advantageous height to which a common pasture should be suffered to grow; but in a luxuriant crop of highly manured clover or Italian rye-grass, the best height may be more than a foot. To mow the latter kind of crop may therefore be much more advantageous than to graze it. Let us assume that a crop of seeds does really, when mown at three or four mowings, give us double the produce of a pasture of old grass, while the land is of the same quality and rented at the same rate. We read of much larger crops than this; and I by no means think it beyond hope, that as agriculture improves we shall always get such crops. Computing the produce to be of equal value with grass, an acre would thus yield 40 weeks' keep for a beast; and its return would therefore be £9. Now in this larger crop let us see what difference in its yield would repay the expenses of summer soiling. I first take the full crop.

	£	s.	d.
Mowing three times at 3s. 6d.	0	10	6
Carrying home 20 tons at 6d.	0	10	0
Carrying back manure, 15 tons, at 6d..	0	7	6
40 weeks' care of beast, at 4d.	0	13	4
	£2	1	4

Now if we suppose that the produce is lessened one-fifth by grazing instead of pasturing, it would, according to this calculation, be nearly as advantageous to soil as to graze. For we should lose 8 weeks' keep of a beast at 4s. 6d. a-week, which would nearly amount to the expenses of soiling. Therefore, whereas it takes an increase of about one-third in a common grass crop to repay the expenses of soiling, it takes only about one-fifth to repay them, when double the amount of crop can be obtained from the land by high manuring. And it is no doubt in the larger crop that we are likely to get an augmented produce by mowing instead of grazing. What I have said of the large crops of seeds applies, of course, with more force to such crops as vetches. These you can scarce graze without immense loss.

But in order to test the advantages of summer soiling, it is not only necessary to contrast the practice with that of grazing, but with other methods of consuming produce. There is no difference as to the amount of produce, whether you mow and carry it to sheds, or whether you consume it on the land itself—suffering the cattle or sheep to remain on the mown land, and follow the scythe. You thus save all the expenses of soiling in sheds, except merely the cutting of the crop, which, together with the labour of moving hurdles and throwing over the herbage, would not amount to more than one-fourth of the whole expense incurred in soiling.

Except in the case where it is necessary to avoid manuring the land, lest the succeeding corn crop should be too rank, this plan of consuming mown produce would, I think, generally be advisable. Or if you should have a field near adjoining which requires manure, then the crop might be consumed on it, instead of on that where it grew: and at least one-half the expenses would be saved by substituting this plan for soiling in the sheds.

We hear it said sometimes that an acre of grass or clover will feed twice or thrice as many beasts when cut at regular intervals, and consumed in sheds. I have seen no experiment recorded which satisfies me that anything like such a difference in the amount produced is attainable; and until fair and accurate experiments are made, I for one must hesitate to believe that on common pasture the crop can be augmented by even one-third or one-half by being cut instead of grazed. As I have before said, we are to contrast a good system of grazing with a good system of soiling. The worst of experimenting is, that it is generally done with a view of proving some favourite theory to be sound; and if the facts favour the theory, they are paraded before the public, but if they do not favour it they are apt to be withheld from publication.

We used to hear, too, that there was great advantage in summer soiling, because manure was made —as if it was not made wherever produce was consumed by cattle. The only question as to the manure is, whether it is applied more advantageously to the land by being made in the yards, and carried to the field at proper periods of the year. I doubt very much if there be much advantage in making the manure in yards; for do what we will, a considerable portion of its virtues will be lost in making it—perhaps a greater portion than is lost when the feeding cattle or sheep distribute it over the fields. But say that the produce from an acre of grass or clover is really augmented so as to cover the expenses of the practice, I think we might more advantageously employ 20s. or 30s. yearly in buying guano or other artificial manure, than in making manure in sheds and yards, even if it be granted that manure so made is more advantageously applied.

Summer soiling has also been recommended, because it enables us to give oil-cake or grain more advantageously with the green food. I do not, however, see the advantage in this respect. At our last meeting, the president of the club showed us how it was possible to mingle grazing with corn feeding; and I do not see any difficulty in applying his plan to the consumption of green food in the field under all possible circumstances.

You will see that although I admit we want sufficient data to enable us to form a decided judgment as to the benefit of summer soiling, as compared with grazing, my opinion inclines to a preference of the latter plan. But in conclusion, let me offer a word or two on the system of summer soiling, when compared with that of winter feeding. We must grow green or root crops on our arable land, and it is a question whether it is more profitable to grow them for consumption in summer or in winter. Now I think there can be no doubt that cattle will pay better for soiling in the summer than in the winter. In one case we consume provender as fast as it is ready; but in the other, we have to store roots, &c., through the winter. The latter process is more expensive, without taking into account that we get more labour for our money in the fine weather of summer than in winter. Besides, it is a well ascertained fact, that all stock returns a greater yield of fat, milk, or growth, for a given amount of food, in warm weather than in cold. I think, therefore, that it would be preferable to grow more summer green crop and consume it in sheds, than to grow all our tillage cattle crops for consumption in winter. And, as regards grass land, it cannot be doubtful that it is preferable to consume it in sheds in summer, rather than convert it into hay for winter use. I grant that a certain amount of dry hay and clover is necessary on certain systems of farming; but I contend, that it is profitable to make that amount as little as possible. The difficulty on an arable farm is to get provender to consume with straw, and to make manure in the winter. I do not see, however, why a large portion of the straw should not be made into manure in the summer, and in order to do so, it would be necessary to adopt, to a certain extent, the practice of summer soiling.

What I have said, I am aware, will not convey any practical instruction; and I can only hope that it may elicit something more useful from the members present. I shall be satisfied with my own labours if you shall think that I have rightly directed your attention to the practical facts, which alone can determine whether summer soiling is profitable or not.

The conversation which followed the reading of Mr. Lyon's paper, turned chiefly on the question whether it was best to graze pastures when the grass was short, or to suffer it to attain a greater length. It was described as the practice of the best graziers not to let the height of the grass be more than two or three inches in length. Admitting that the whole produce of an acre of pasture was greater when the grass was from six to eight inches high, it was contended, that the more nutritious qualities of short grass made up for the loss of bulk, and that the stock increased in value more for a given quantity of food. On the other hand, instances were adduced by members, where cattle milked as well, fed as well, and grew as well, in a high and full pasture. It was affirmed, too, that cattle fed in the sheds on mown grass made what is called as "good proof" as when grazing on a short bite. But as far as related to summer soiling on mown grass, the general opinion of the members seemed to be, that it would in no case pay so well as grazing. And as to summer soiling on other crops, it was thought, that while it was profitable in some cases, yet that generally it was more so to consume them in the field. In the case of a farmer who had a more than ordinary skill in disposing his labour to the best advantage, the practice might be desirable; but where much was left to the care of labourers, the eye and skill of the master were perpetually needed, or loss would be incurred. Professor Way had shown, that on soils containing clay, it mattered little whether manure was laid on long before the crop, or with it—the clay retained all the virtues of the manure. But sandy soils did not retain the manure in the same way; it might, therefore, be expedient to carry away green crops from such soils, and return the manure to them at the time of cropping them. It was conceded by the members present, that nothing was more needed to clear up the subject of summer soiling than such data as Mr. Lyon had referred to in his paper; and the club thanked him for the useful suggestions contained therein.

SPROTBRO' FARMERS' CLUB.

On Thursday, the 24th of October last, a meeting for discussion was held at the Copley Arms Inn, Sprotbro'. The chair was taken by the Rev. J. G. Fardell. The subject for discussion was—

ON THE BEST METHOD OF MAKING MANURES.

The **Chairman**, in introducing the subject, said, manures were divided into three classes—the organic, the inorganic, and the mixed. The organic manure was that formed from animal or vegetable matter, the inorganic was that formed from limestone or mineral substances, and the mixed from a combination of the two. These were the three main points which would present themselves for consideration that evening; and the question for them to determine would be as to the proportion in which these three classes of manure should be used in order to convey as much of the fertilising qualities to the land as possible. He concluded by reading an observation which seemed to him to be very applicable to the present occasion. "He that applies a peculiar species of manure which he finds beneficial to his ground, himself ignorant of chemistry, only follows a practice to which he has been long accustomed; and, while he sneers at the theorist who directs attention to the principles of his art, is, perhaps, mainly indebted to the practice which he follows to the observations of the man of science."

Mr. **Dent**, of Marr, was called upon to address the meeting. He observed that, in his remarks, he must be understood to speak as a tillage farmer, and not as a grazing farmer. In the first place he would advise them to keep a large quantity of stock, and keep them well. He considered it a very bad practice to turn cattle into the straw-yard through the winter, and give them nothing but straw to eat. He recommended that turnips and cake should be given in order to keep the cattle in good condition, and he thought it was not a good plan to give them too much straw, but only just sufficient to make them warm and comfortable. It was indispensably necessary that all the farm-buildings should be spouted, and he would endeavour to let as little water come into the yard as possible. He particularly cautioned them not to make bad manure, but advised them to make as much as they possibly could under the circumstances he had pointed out. He recommended that in summer time all the working horses on the farm should be kept up in the yard and fed on green meat. By this method he thought a great deal of manure, and of very good quality, would be made. If any of the manure should happen to get mouldy, he would not take it out, but allow it to remain until it had been worked into a proper state. When the manure had been removed from the yard into the field and put on a heap, he would have it carefully covered over with fine mould, in order to keep in the ammonia. He was a great advocate for saving all the refuse of the farm, or any vegetable matter whatever, in order to turn it into manure; and, after it had become sufficiently decomposed, he thought it would be well to mix it with a little animal matter. In a general way he did not reckon to burn anything upon his farm, except what he might require occasionally for ashes. He did not even burn twitch; for he found that, when thrown upon a heap and occasionally turned, it became decomposed and made excellent manure, Two years ago he had some thrown upon a heap, and it had now become converted into a fine vegetable mould, and there was not a particle of twitch to be seen in it. With respect to the drainage from the manure-yard, he recommended that, if possible, none of the liquid should be drained away, for on a farm where there was a great deal of corn nearly the whole of it would be absorbed. If at any time he should have too much liquid in the yard—which was very seldom the case—he would rather have it taken up and put into tubs than allow it to run away.

Mr. **Dyson**, of Braithwell, said that the plan he now adopted for making manure was the best he had yet met with. His yard was a large square, divided into three compartments, and most of his buildings were spouted. Spouting he considered to be a great desideratum; and, in fact, if landlords acted towards their tenants as they ought to do there would not be a farm building in the country without. In one of the compartments he had alluded to, his bullocks were fed, and in the centre yard he had a large tank capable of containing 7,000 gallons, into which the urine from the beast sheds drained. They had generally a deficiency of water upon his farm, and he never had too much upon his straw, but still there was always quite sufficient to reduce it into manure. The system which he adopted for making manure was the box feeding one, and to each animal he allowed 9 feet square. The beasts had sufficient room to turn round at their pleasure, and the manure was in this manner properly compressed, and never removed until the box was full. They were also well protected from the weather, and nothing but their urine (which flowed into the tank) was taken from the boxes. If, however, at any time it should be found necessary to remove the manure from the box, before it was required for the land, he had a little salt thrown upon it to prevent the ammonia from escaping. By the plan which he had mentioned no disagreeable smell was emitted; but the continued pressure of the cattle upon it made the whole of such a consistency that, when the time arrived for taking out the manure, they had to cut it with a common hay knife before they could remove it. In summer he adopted the same system, feeding the cattle on green meat. During the summer and the winter he obtained about ten cart-loads of manure from one box. He preferred putting the manure upon the land when it was not too much decomposed; and when he had it taken out of the box he seldom led it to a heap, but had it taken direct to the land, and ploughed in as soon as possible. With respect to his horses he never turned them out, but went on the soiling system as much as he possibly could. He agreed with Mr. Dent in his opinion that when any manure was led out it ought to be carefully covered with soil. Independent of the box system he had also manure made in the fold-yard, and he was careful not to give the cattle too much straw. He recommended that the animals in the fold-yard should occasionally have a little chop mixed with cake, for he considered that the manure from cattle which fed only upon straw was almost worse than nothing.

Mr. **Clark**, of Cusworth, inquired if the heat arising from the manure obtained by the box-feeding system did not injure the cattle?

Mr. **Dyson** replied that no heat whatever came from the manure; and if a wet place was seen in the bedding, the man who attended the cattle immediately put some clean straw down. He had tried several systems, but this he found to be decidedly the best. The beasts always lay at their ease, and there being no master bullock to drive them away from their meat they fattened much more rapidly. The troughs from which the cattle fed were moveable, and were gradually raised as the quantity of manure increased. The only fault he had to find with his building was that it was thatched instead of being tiled and slated.

Mr. **Newham**, of Edlington, on being called upon to address the meeting, said he entirely concurred in the observations which had fallen from Mr. Dyson. He was an ardent admirer of the system of box-feeding for making good manure, and would impress upon them the vast superiority and advantage attendant upon having their buildings substantially slated and tiled, instead of being thatched. He considered further that the system adopted by Mr. Dyson was the most economical which could be pursued, for the manure being well compressed by the animals and shielded from the influence of the atmosphere, all its fertilising qualities were retained. He thought this plan superior to that of his friend Mr. Dent, for should the same quantity and the same quality of food be given to the cattle under both methods, the manure from those fed upon Mr. Dyson's system would be considerably more powerful.

Mr. **Dent**: Hear, hear; I have no doubt of it.

Mr. **Dyson** said he had never made an experiment between the manure from the boxes and that made under the ordinary method, but he intended this year to try the experiment.

Mr. **Wood**, of Sprotborough, next gave the result of his experience. He considered it most preposterous to attempt making manure in the fold-yard by keeping cattle upon nothing but straw, for he thought that it would be perfectly valueless, unless some description of artificial food was given them occasionally. Two years ago he was induced to pay more attention towards the systems of making manure than he had ever done before. In October of last year, he put some cattle into some loose places, four in a place; and he commenced by giving them 10st. of turnips and 9 lb. of cake each per day. In this manner he kept them until March, when their quantity of food had gradually been increased, and they then ate about 14st. of turnips and 10 lb. of cake per day. The manure was not removed until it was required for the land. He allowed it to remain until the turnip season, and he then found that he had manure of a quality which he never had before. The bottom part of it was led out and put upon the land immediately.

The remainder he had placed on a heap and covered with wick ashes, in order to fix the ammonia. He recommended that cattle should be fed upon a fair proportion of artificial food mixed with straw. He could not, he confessed, improve upon the system adopted by Mr. Dyson and Mr. Newham. Shed-made manure he considered to be far superior to fold-yard manure, and, besides, the cattle which were protected from the weather increased faster in bulk than those which lay out of doors. In conclusion, he observed that he could suggest no better method for making good manure than that of feeding cattle on artificial food mixed with straw.

The **Chairman** here observed that they ought to endeavour as much as they possibly could to make the quantity of manure which they required upon their own farms, for it was well known that many of the artificial tillages which were sold were very much adulterated.

Mr. **Newham** said that upon a poor farm it was almost impossible to do without artificial manure. Fifteen years ago he went to Edlington; he took a very poor farm, and he employed artificial tillages very extensively, and the consequence had been a very beneficial change in the soil. At the present time he made much more manure upon his farm than was the case at that time, but he still continued to use large quantities of artificial tillages. When first he entered upon his farm he took some manure at a valuation. The men had been accustomed to draw a load of this manure with one horse; and some time after he entered on the farm, one of the labourers being about to take some manure to some land, filled a cart with the manure which had been made on his (Mr. Newham's) plan, and yoked a single horse to it; but it was found to be so much heavier than the manure they had been accustomed to, that the horse could not move it. He could not convey to them the difference between these two kinds of manure as regarded their fertilising qualities: it was perfectly astonishing. The heavier manure produced nearly as much more turnips as the light manure; but the benefit did not rest there, for the succeeding crops were in like measure improved until the land came to fallow again. This showed the paramount importance of having good manure, for, unless particular attention was paid to that subject, they could not farm with a profit. It was very expensive, he must acknowledge, to buy artificial manures; but he was obliged to do so or he could not manure all his land when it came into rotation. He had last year sown 137 acres of turnips, every inch of which was manured from the manure which had been made upon his own farm. This would have manured double the quantity of land had he used artificial manure along with it. He had 23 working horses upon his farm and he never allowed one of them to be turned out, but had them all soiled in his yards. In summer he fed them upon green meat, which he had taken means to provide for them. In July and August he gave them lucerne and sainfoin. As to beasts, he repeated that no better plan could be adopted than the one mentioned by Mr. Dyson, for he was quite sure that that was the only method by which they could make good manure at a little cost. On his farm he fed a great quantity of pigs; and the reason he did so was, that he found from experience that a pig would produce a greater quantity of meat upon the same quantity of food than any other animal he knew. These pigs, between 50 and 60 in number, were, he considered, almost essential towards making good manure in a farm-yard; and as they were always rooting about, they prevented the manure from ever becoming mouldy. He had a large trough placed down the middle of the yard, which was protected from the beasts; and as the pigs stood upon the flags to feed, if a little meat was thrown out they generally picked it up again. This they would find, if they had a great number of pigs, to be a very economical method. The bars of the gates leading into all the yards were cut away in such a manner as to allow the pigs to pass under, and they had thus access to the whole premises. In process of time, as the pigs got too fat to get out of the way of the beasts, he had them placed in protected sheds. He fed them upon corn, turnips, and potatoes, mixed up together; but for a month or so before killing he fed them almost entirely on corn, as he considered that it made the bacon sweeter. Nothing, however, he considered to be more nutritious and better for pig-feeding than Swede turnips.

Mr. **Dunwell**, of Wilsic, thought mangold wurtzel very nutritious and good to give pigs after swedes were over.

After some general conversation amongst the members the following resolution was arrived at:—"The meeting is of opinion that the best manures are made by a free use of artificial food along with the straw, and most strongly recommends box feeding as producing the best quality. The meeting also begs to add that all farm-buildings should be effectually spouted, as the water therefrom deteriorates the quality of the manure."

STORRINGTON FARMERS' CLUB.

ON THE BREEDING, REARING, AND FATTENING OF NEAT STOCK.

On Tuesday, October 22nd, the members of the Storrington Farmers' Club held their customary periodical meeting; Mr. T. L. Upperton in the chair. There were present, Messrs. R. Chatfield, Boxall, Battcock, Hardwicke, Duke, Stanford, Allen, Sparry, Mudd, Mant, Stent, Rigden (Hove), and Lear (Hon. Sec.)

The Minutes of last meeting having been read, the CHAIRMAN called upon

Mr. ROBERT CHATFIELD, who rose to address the meeting on the subject appointed for the evening's consideration, namely, the breeding, rearing, and fattening of neat stock. He commenced by apologizing for any presumption which might be attributed to him in venturing to introduce a subject of so much importance, and stated that it was only at the urgent request of many of the members he had come forward on that occasion. He did not assume to be better acquainted with the matter on hand than other gentlemen present, but he was willing to tell them all he knew, and he trusted that others would be found in the meeting to inform them of what he did not. In the breeding of stock the first necessity was to attend thoroughly to its character, quality, and symmetry; character and quality indeed would always go together, and if they obtained one they could not be far off from the other. As to the merits of the different breeds he had little to add to the statement recently made by a talented member of this club, Mr. Stent. On the advantages of the Sussex stock that gentleman had left him very little to say beyond the remark that he (Mr. Chatfield) coincided entirely with what Mr. Stent said upon the symmetry and quality of this breed. He would therefore proceed at once with what he conceived were the best characteristics of it. As a first necessity they generally looked to the head of the animal. He was convinced the head was the best thing to show the breed and constitution of the animal, and if they could not get some symmetry about this they might be pretty certain they would have none about the body; in the absence of a good head they would only get a bad body. As there was no rule without an exception, there might be some instances contrary to this, but if there were they had never fallen within his experience, and he recommended them at all times in selecting stock for breeding to look well at the head. The face should be long and thin below the eyes—broad between the eyes, and the eyes themselves prominent; the horns might be as long as they liked provided they were fine at the roots. They should then look for the white nose—not an extra white nose, for with this he did not agree—but above all it should not be a black nose; he himself preferred a nose with a yellowish hue; as he thought there was a great deal of delicacy about a purely white nose. They were next to take the chine; let this be perfectly straight, and the animal should be broad across the loins, broad across the hips, and particularly broad across the rump; the ribs should be springy, the shoulder blade laid well back, with the point of the shoulder not too prominent. The next point was one in which consisted the great difference between the Herefords and the breed he had been speaking of, namely, the depth of the loin to the flank. They should particularly see that the animal was long in the hind quarter; not, however, to such an extent as to destroy its symmetry. He must again urge the importance of well regarding the quality of the horn, as he had always found that the coarser the horn was at the root, the coarser would be the quality of the animal. They should also be careful about the thighs and legs; if these were too thin the flesh produced would be of bad quality, and, on the other hand, if they were too thick a great deal of superfluous flesh would be produced. There was no occasion for him to dwell further upon the symmetry of the animal, for this would be of course made up in the combination of the points he had recommended to their attention. The next portion of his subject was the rearing of the animal after it was bred. In rearing neat stock after they were bred his practice was to let them run with the cows, occasionally milking the cows, and using the milk for dairy purposes. His surplus of milk not required for the calves was, however, always taken from the older cows; for he found that the younger ones, from their aptitude to fatten, did not yield more milk than the calves required to get them to early maturity. Early maturity, he considered, was everything at present prices. The object should be to keep an animal well, so as to turn him into their pocket as soon as they could (Hear, hear). The Sussex breed would very shortly go dry, compared perhaps with some other breeds, and were therefore not the best milkers, but then on the other hand they would make flesh faster—a point desirable with most breeders. He always allowed the calves to run longer with his three-year-old heifers than with his more advanced stock. His general time for allowing the calves to run varied—it was four, five, or six months, according to circumstances. He always weaned the strongest and best calves first, allowing the weaker ones to run with their mothers longer, so as to assimilate them in the end as nearly as possible to an equality with the stronger ones. In a damp country the calves after they were weaned required particular attention; they were subject to a disease called the whiff, which would depreciate the herd to a great extent, if particular care were not taken. In a damp country it was a good plan to place them upon a little hay, and never to let them run upon the grass till the dew was off. It was in the month of September, or the first week in October, they were very apt to catch this disease; but after this they would in a manner become more seasoned to the atmospheric changes. Indeed he should recommend that at the time he had spoken of, unless very fine weather, they should be taken entirely into the yard and fed upon hay and cut chaff, and straw with about 1 lb. of oilcake. But now there was another evil arising. The calves were liable to another disease called the puck. No sooner were the difficulties of September and October got over with respect to the whiff, than, from the change of feeding and other causes, the puck was liable to be superinduced, and he would suggest that some kind of medicine should at the season be administered to them. In going from soft food to hard the calves required a little preparation before they become seasoned to it. The puck was a disease which caused very great weakness, and was often very fatal. He knew a farmer one year who, out of 15 or 16 calves, lost six or seven by that disease. There were many persons who endeavoured to rear more calves than one to a cow; indeed he knew of some instances where four calves were put to one cow; but he thought it must naturally follow that in those cases the calves so brought up could not be so strong as to enable them fairly to bear up against the trials of the coming winter, and he questioned if the parties who did so made so much of their four calves as he did of his one. He should recommend as food for the young stock good seed-hay, particularly trefoil or Dutch; indeed he believed trefoil without cake to do them as much good as brook hay with cake. There were many who contended that the young stock did not require such good hay; but it so happened at the time when the weather was inclined to be a little wet, with foggy mornings in September, that after bringing them home to avoid the whiff they were subject to diarrhœa, and afterwards they became pot-bellied and weak, and he held that the better the food the more likely they would be to contend against these casualties. There could be no objection to their being turned out in the middle of day, even at the time he had spoken of, when the weather was fine; but he could not too strongly urge the necessity of not allowing them to go on the grass till the dew was off. Occasionally he varied the food; instead of giving them hay with cake, he would sometimes give them bran with cake, at the rate of 1 lb. of cake per day. When he gave them hay he found one truss with some cut straw was enough for six calves, and they did uncommonly well upon it. He next came to the fattening of neat stock; and this was a part of the subject on which he scarcely felt himself at home. He did not feel himself competent to give them any advice upon any mode of fattening, particularly as it regarded stalled beasts. Before he came into this part of the country, his experience only extended to pasture land: the bullocks were turned into the grass, which was so good that they got fat upon that alone. Many a good beast had he fattened in that way. This, however, was a different country, and another system was necessary. Stall feeding was in general adopted, and in the article of manure a great advantage accrued from it. The best method he had found was to feed the stock on cracked corn with linseed; he had had beasts driven almost beyond nature by this description of food. He had tried different sorts of food, but he never knew any to do so well as boiled linseed with the cracked corn. In 1844, in particular, he had a bullock in which he felt great interest; he tried him with this sort of food, and his size was driven almost beyond his own nature by means of it. His cracked corn was either beans or barley, and he boiled one-third of linseed with two-thirds of water.

Mr. Boxall: Measure or weight?

Mr. Chatfield: Measure; one gallon of linseed to two gallons of water. This made a stiff linseed gruel, and when it was cold it was so stiff it could be cut with a knife. When he wanted to use it, he took a little warm water and dissolved it, and then stirred in the meal or cracked corn with it. The beasts ate this food with a remarkable appetite—a bullock never refused this food—and he had often seen one fatten at the rate of two or three stone a week upon it. Mr. Chatfield then made some observations on the subject of manure, in connection with stall-feeding, and regretted that, from the fact of his farm buildings having thatched roofs, he could not manage his manure in the way he wished. He concluded his address by inviting the remarks of his brother farmers on the subject he had introduced to their notice.

Mr. Boxall asked Mr. Chatfield what his

opinion was as to the cause of whiff in calves, or, as some called it, husk or ooze?

Mr. CHATFIELD attributed it entirely to a damp condition of the atmosphere; and, as an illustration, he stated that about nine years ago he had occasion to leave home for a few days, at the time he had referred to as being that at which calves were liable to catch the whiff. He left strict orders to have the calves removed from a damp situation. On his return, he found those orders had not been complied with, and, there having been misty and foggy mornings, he had strong fears as to the result. There were 27 in the field; and when he came and rattled his hat to make them move, he found that there was not one but what was affected with the whiff. The sort of country which was likely to entail the whiff or husk upon calves, was also the country which superinduced the rot in sheep. When the calves had the disease very bad, and it had reached its height, the insects could be seen, with the aid of a magnifier, crawling out of the nostrils. On the occasion to which he had referred, he had lost nine calves with the disease; but such had been his management that he had never lost one since, though he seldom had less than 100.

The CHAIRMAN to Mr. Chatfield: Then it is your opinion that the rot in sheep is the same thing as the husk or whiff in calves?

Mr. CHATFIELD: Not exactly the same, because one is a disease of the lungs and the other of the liver; but I believe they both proceed from the atmosphere, and not from the soil.

Mr. RIGDEN was of a different opinion. The rot in sheep was not heard so much of now as it was twenty years ago, when the land was not so well drained.

Mr. CHATFIELD: Draining alters the atmosphere as well as the soil.

Mr. RIGDEN: It won't prevent mists rising from the surface, particularly in the neighbourhood of rivers. I believe the rot is caused by the food.

Mr. CHATFIELD: Sheep will not feed of a night —not till the dawn.

The CHAIRMAN: You mean to say it is contrary to their nature to do so?

Mr. CHATFIELD: I do not mean to say it is contrary to their nature, but it is a matter of general observation that they do not.

Mr. RIGDEN: Not under all circumstances. The sheep I fatten for the exhibition eat more in the night than in the day.

Mr. CHATFIELD: That is an exceptional case.

Mr. LEAR: Sheep will eat a great many turnips during the night.

Mr. STENT said that he agreed generally with what Mr. Chatfield had said upon the breeding, rearing, and management of stock, but still there were some minor points he did not entirely coincide in. The first thing was the colour of the nose. Mr. Chatfield preferred a yellowish nose, while he (Mr. Stent) did not care one farthing what the colour of the nose was. He believed that as you could not have a good horse with a bad colour, so you could never have a good beast with a bad coloured nose. Mr. Chatfield did not tell them what time of the year he calved down.

Mr. CHATFIELD: In March.

Mr. STENT thought so from the general explanation of his mode of treatment. Now he (Mr. Stent) adopted a different system. He calved down in November or the beginning of December, and let the calves run with the cows three months or fourteen weeks, according to circumstances. Mr. Stent then went on to detail briefly his mode of treating his herd, a subject into which he entered at large at the meeting of the club in April.

Mr. RIGDEN said he was a breeder, in a smaller way, of short-horns, bringing up about 15 to 20 calves in the course of a year. His calves never had any milk after they were three days old; the milk was too valuable. After that, they were fed upon linseed and oatmeal, and he found they did very well upon it till the time came for them to shift for themselves. Under any circumstances he did not think it a good plan to let calves run long with the cows, for when they did so it took the calves a considerable time to recover the effects of the change when they were weaned. For breeding purposes he thought there was nothing like a good short-horn, and he thought if they would try them with their Sussex stock they would find their account in it. It had been stated that if the cows were tied up when in calf, that abortion or premature birth would be the consequence. Now, his plan was to tie up his cows about a week or ten days before calving, and he never had an instance of slinging.

Mr. STETT inquired how the oatmeal and linseed were given to the calves?

Mr. RIGDEN said they were made into a thin gruel, and the calves sucked it out of a bottle.

Mr. CHATFIELD said the plan might be a good one where the milk was valuable. In Mr. Rigden's neighbourhood it was worth much more than it was here.

Mr. BOXALL expressed an opinion that the whiff, husk, or ooze, alluded to by Mr. Chatfield, did not proceed from anything in the air which the calves breathed. He thought that it resulted from the eggs of the insect getting into the nostrils of the calves while they were feeding, and being drawn into the lungs were hatched and became the insects as described by Mr. Chatfield. This theory was not altogether irreconcilable with that gentleman's idea of its originating in a damp air, for it might be in a moist condition of the air that the eggs adhered more particularly to the nostrils of the animals, or the eggs themselves most abundant. He (Mr. Boxall) was not a breeder to a large extent, 16 or 18 perhaps. In rearing the calves his plan was to put two calves to one cow.

Mr. **Lear** had had very little experience upon the subject which formed the discussion of the evening, but from what little he had seen he was inclined to agree with the plan of letting a cow suckle two calves, but it was highly important that they should be as nearly as possible of the same age. The few calves Mr. Lear reared were for dairy purposes; and after he had briefly detailed his mode of management with regard to pasture, he proceeded to censure the practice of sending beasts to market for sale to the butcher in a condition little if at all above fair stock condition. The object of the farmers, he said, ought to be not to compete with the foreigner in the badness of the cattle, but to endeavour to beat him by sending to market cattle of a superior quality. He saw some beasts at Arundel last market, which he thought were a great disgrace to the parties who sent them, and he (Mr. Lear) thought it was the greatest possible mistake on their part; for if a beast in good condition would not pay, still less would such lean cattle as that. Under these circumstances he could not wonder that prices should be so low—indeed he thought they got a good deal higher price than they deserved for such stuff. In conclusion, Mr. Lear did not agree with giving, as some did, large quantities of roots to the beasts—say three or four bushels a day. On the contrary, he thought that if they gave them less roots, and even less hay with a little more linseed or oilcake, they would do much better.

A conversation arose upon the practice of sending unfattened stock to the market for the butchers, and Mr. Rigden partially accounted for it by stating that at this period of the year it was necessary to get rid of the beasts from the marshes, and the graziers were not in a position to house them all the winter.

Mr. **Stanford** stated that his mode of feeding cattle consisted of linseed boiled into puddings. He had found these to be cheaper and quite as efficient, if not more so, than oilcake.

The discussion was brought to a close by Mr. Chatfield replying to some of the observations made by the various speakers in the course of the discussion.

EAST BERWICKSHIRE FARMERS' CLUB.

A monthly meeting of the members of this club, was held in the Assembly Room of the Red Lion Hotel, on Monday, the 14th October, for the purpose of discussing the report laid before them at the last half-yearly meeting, by David Milne, Esq., of Milne-Graden. There were about sixty members present; amongst whom were the Right. Hon. the Earl of Home; George Buchan, Esq., of Kelloe; Wm. Hay, Esq., of Dunse Castle; Alex. Mitchell Innes, Esq., yr., of Ayton; David Milne, Esq., of Milne-Graden; John Wilson, Esq., of Cumledge; George C. Trotter Cranstoun, Esq., of Dewar; the Rev. W. C. Lundie, of Spittal; Captain Jeffrays, of Sunwick, Dr. Clarke; Capt. Hay, R.N.; Major Logan Home, of Broomhouse; George Home, Esq., of Gunsgreen; Dr. Hood, Whitecross; Mr. Glendinning, Broomdykes; Mr. Turnbull, Dykethead; Mr. Wm. Dunlop, of Mayfield; Mr. Herriot, Whitelaw; Mr. Ogden, Berryhill; Mr. Gibson, Foulden, Westmains; Mr. Wilson, Edington Mains; Mr. Hastie, Hutton Mill; Mr. Bishop, Reston Hill; Mr. White, Littledean, Mr. Gibson. Chesterbank; Mr. John Clay, Wynfield; Mr. Murray, Marygold; Mr. Dalgleish, Blanerne; Mr. Balmer, Hilton; Mr. Sturdy, Flemington; Mr. J. Thompson, Berwick; Mr. Willoby, Berwick; Mr. Cockburn, Harelaw; Mr. Darling, Mordington Mains; Mr. John, Nesbit, Rumbleton; Mr. James Black, Greenlaw Dean; Mr. J. Cunningham, Coldstream; Mr. Makins, Auchincraw Mains; Mr. Inglis, Prenderguest; Mr. Bird, Renton Barns; Mr. Alex. Wilson, Rawburn; Mr. Dodds, Foulden Dean; Mr. Banks, Coldstream; Mr. Hardie, Redhall; Mr. Middleton, Cocklaw; Mr. Tait, East Reston; Mr. Blackadder, Blanerne Eastside; Mr. Nicholson, Lennel Hill; Rev. Mr. Edgar, Hutton; Mr. Hosick, Hutton, Mains; Mr. Makins, Shellacres; Mr. Cowe, Dowlaw; Mr. Bowhill, Eyemouth, &c., &c.

Upon the motion of Mr. Milne, John Wilson, Esq., of Cumledge, was called to the Chair, in the absence of both Mr. Dickson, of Peelwalls, the President, and Mr. Renton, Convener of the Committee.

The **Chairman** said this was a particularly interesting meeting of the club, as they had now met not only to discuss the merits of Mr. Milne's able pamphlet, but to decide upon the merits of an old and a new system of agriculture. He believed there were some individuals present who were prepared to go into the question, and to show whether it would be prudent to adopt the new system altogether; and he was of opinion that even if the system could not be fully adopted, many useful hints could be gathered from it, although it might be dangerous to go all at once into it. He was glad to see so numerous an attendance of the members of the Club, and he trusted that all who were prepared would not hesitate to give their opinion upon the useful report, for which they were deeply indebted to Mr. Milne. In the first place, he understood there were one or two errors in Mr. Milne's report, which it would be but fair to give Mr. Milne an opportunity of correcting before the discussion began. He understood also that Mr. Cunningham, of Coldstream, who had been visiting the farms of Myremill and Auchness, was prepared to lay before the meeting statements of the expense attending the erection of the buildings for carrying out the new systems of feeding stock, and preserving and applying manure. He then called upon Mr. Milne for any explanation he might feel it necessary to make.

Mr. MILNE said that he would avail himself of the opportunity afforded, to say, that he was quite ready to give any explanation in his power, of points not made sufficiently clear in his report. He might however, remind members that as the report almost altogether referred to the practices of third parties, there were necessarily many things which he could not be expected to explain. In his report he had only given what had fallen under his observation. He would take this opportunity of mentioning and admitting one or two mistakes, and of saying that he was not surprised that such should have occurred, as he was deeply conscious of, and had always freely admitted his comparative ignorance of practical farming. He trusted that members would excuse these mistakes, and he would respectfully suggest, that in discussing the report, they should turn their attention to its merits (if it had any), as the course most likely to be productive of practical good rather than waste time in exposing errors which he was ready to acknowledge. Mr. Milne then pointed out one or two errors in the report which, as he said, were not of a nature to affect general principles, and which must be quite palpable to the eye of every practical farmer. The proposal he made at the conclusion of the report—viz., that the club should appoint a committee of its practical members to visit the farms mentioned by him sufficiently showed his distrust of his own powers. Should such a proposal be adopted, he might mention that he had that morning received a letter from a proprietor of the county stating his willingness to contribute to the expenses of such a deputation. But it strongly occurred to him (Mr. Milne) that it would not be necessary to incur either the expense or the delay attending such a measure; because since last meeting, circumstances had come to his knowledge which he thought superseded it altogether. Several members had been on a visit to one or two of the farms mentioned in the report. These gentlemen were present, and he would suggest that, before proceeding to the discussion of his report, they should be invited to state what they had seen there, and also how far their observations and experience led them to approve of the practices there carried on. The meeting would then be able to judge his statements and suggestions. He had also learned, to his great delight, that several tenants of this district had lately been trying and carrying into execution on their own farms some of the practices described by him. One of these gentlemen, Mr. Nisbet, of Rumbleton, had for the last seven or eight years used a tank capable of holding 10,000 gallons of liquid manure. He could mention, if called upon, how far he had found the system a profitable one. Mr. Nisbet had also used Garrett's horse hoe—an implement which was used on Mr. Rigden's farm, and which he hoped Mr. Nisbet would describe, as he did not suppose another existed in the district. Then, as to the feeding of stock in sheds, instead of turning them out into the fields, and the giving to them a greater variety of food, he understood that information on these subjects could be given by members now present, and he trusted they would do so. The meeting would then be in possession of sufficient information to enable them to come to a conclusion as to the correctness of his report in several essential particulars, and the applicability to this county of the practices there mentioned. He would only add, that any conclusion to which the meeting might come, would most assuredly carry with it great weight, in consideration of the large attendance then present, both of landlords and tenants. Whatever might be the result of the discussion, he felt satisfied that the proceedings of the day would be conducted with good temper and good feeling, and would afford additional proofs of the intelligence, and agricultural knowledge, and energy of Berwickshire farmers (applause). Before sitting down, Mr. Milne referred to several specimens of Columbia clover, exhibited by Mr. Banks, of Coldstream, mangold wurzel grown at Dunse Castle, Ladykirk, and Milnegraden, and of kohl rabi and Belgium carrots grown at Milnegraden. These, which were of large size, and grown in the same field, and with the same manuring as the ordinary turnips, at the termination of the proceedings seemed to attract considerable attention from the members.

The CHAIRMAN then invited Mr. Cunningham to lay before the meeting the result of his observations on the farms he had visited, on which systems similar to those under discussion were carried on.

Mr. **Cunningham**, previous to seeing Mr. Milne's printed report, had visited the farms of Myremill and Auchness, in Ayrshire. At Myremill he found all that was at Auchness, and a good deal more. Indeed, the only thing he saw at Auchness worthy of remark, was the large breadth of potatoes. The Italian grasses were there very luxuriant, but exceedingly foul. He was led to believe the district was favourable to green crops; but the turnips which he saw were not superior to those in our own district. It was the preservation and application of the manure, and the feeding of the stock, which principally attracted his attention. In reference to these particulars we make the following extracts from Mr. Cunningham's report:—

"Having, in June last, seen the system of stall-feeding, as carried out at Auchness and Myremill, and believing this to be the leading feature and foundation of the whole improved mode of culture, I have prepared some plans and probable estimates of the expense of obtaining the necessary accommodation, which I now beg to submit to the consideration of the meeting.

"1. As regards the extent of accommodation, I believe that as a general rule for feeding off alone, there should be a stall for every four acres of the farm. This would require for a farm of 400 acres 100 stalls; and, supposing that the system adopted at Myremill and other places were followed out, of feeding off two casts in the year, this gives accommodation for feeding off 200 cattle per annum. In building a new set of farm offices for this system, the arrangement would be different than at present, and perhaps much improved; but we proceed upon the idea that there exists a certain amount of accommodation, and not more than is actually required for the manufacturing of the crop, and the housing of the stock and implements of husbandry usually required—and if farmers are to breed and rear cattle until ready to be fed off, they will require all the courts, sheds, &c., they at present possess, and the feeding houses must be a new appendage altogether. The plans produced are made out with this view, and to build and finish these in a substantial and satisfactory manner will cost at the rate of £5 for each animal, exclusive of cartage, which, in ordinary situations, will cost £1 10s. additional. These erections are supposed to consist of stone walls, foreign timbers, roofs, &c., and slated. The floor laid with square flooring tiles, upon a bed of concrete, and having suitable channels for conveying off the urine, &c. The roof lathed, and this, as also the walls, to be plastered. A close and uniform floor and smooth surfaces throughout the building is considered essential for the thorough ventilation, purity of the air, and health of the animals within; and when it is considered that the number of 60 or 70 are located under one roof, it appears prudent to take every precaution to insure the thorough ventilation of the building. As yet I have not seen any of these places so thoroughly ventilated as could be wished, and great variety of opinion exists as to the best mode of accomplishing it. One leading feature, however, must be the admission of an abundant supply of pure air from without, and the abstraction of the vitiated air from within. I propose, in the plans shown, to admit the air by pipes and gratings in the feeding passages, with additional pipes in the walls, and to place a trough or box along the apex of the ceiling, pierced with small holes, and this to terminate in a chimney within the flue of the boiler, thereby rarifying the air, and assisting materially in keeping up the circulation required.

"2. The collection of the liquid manure in tanks is indispensable, and these I would recommend to be built of a circular form, instead of an oblong square as at Myremill, and lined with brick, and coated with cement. This form gives the largest area at least expense of walls; and further, should the new mode of distributing the liquid manure be adopted by means of forcing pumps and pipes, it is indispensable that an apparatus be applied to stir up the more solid parts, so as to send forth, in an equal form, the entire contents through the pipes, and the circular form being the most suitable for effecting this by the aid of machinery. A supply of water is also required to give the animals, washing out troughs, and flushing the gutters, and to dilute the manure, all of which should be conducted by pipes into the troughs and tanks. The question of converting the whole manure of the farm into a liquid state may not receive the sanction and approval of many agriculturists; of its efficiency applied in this form I cannot give an opinion, and as the mode has only recently been adopted in this country, it would be hazardous to pronounce upon its utility. I have made a calculation of the expense, and if other points are as satisfactory, I doubt not but it will one day be generally adopted. In order to bring the matter of expense to a test, we shall suppose a farm of 400 acres, and 100 acres of this in root crops, and supposing 70 acres of these consumed in the offices, and 25 tons per acre as a medium crop, gives 1750 tons.

50 acres of Italian rye-grass, cut thrice, 20 tons per acre	1000	,,
200 acres of corn, straw of do., 1½ ton per acre	300	,,
And an addition of ⅓ at least of water, equal to	1000	,,
Say................	4000	tons.

Now this may be all sent through pipes by means of the steam engine working 5 hours in the week upon an average for 52 weeks=260 hours.

The engine power I estimate at 2s. per hour..	£26
Four men employed, say 3d. per hour	13
Interest on pipes and tear and wear	30
Do. on tanks, say	6
	£75

Compare this with the filling, carting to the fields, turning, filling, and carting out again, and spreading of say 3000 tons—1000 tons may be assumed to be lost by evaporation—I think it would not be over-estimating if I put it down at 1s. per ton. This is exactly double, £150. There is another consideration, and not the least important. By getting the manure applied in this manner, it lessens the amount of labour in May and June, when the turnip crops are being got in, and which is generally the season of greatest exertion to get finished in time. Any arrangement that can tend to equalize the labour of the farm would unquestionably be a decided advantage."

Mr. Cunningham then entered at considerable length into the details of estimates and plans which he had made of the expenses and accommodation required for carrying out the new systems of feeding cattle, and collecting and distributing liquid manure. He estimated the expense of the whole apparatus for collecting and distributing the manure over a 400 acre farm at £1 10s. per acre; and the expense of building feeding-byres on the new system, reduced to the standard of acres at £1 5s. per acre, or £300 for 60 head of cattle. The expense of building feeding-boxes he estimated at nearly £10 per animal, and the expense of altering and fitting up present sheds and stalls at £1 13s. per animal. Mr. Cunningham had also visited the farm of Mr. Littledale, in Cheshire, whose cattle are constantly fed in the house, summer and winter. The principal features of his system were the size and airiness of his buildings, and his mode of feeding, which was nearly the same as at the Ayrshire farms.

Mr. Nisbet, of Rumbleton, upon being called upon by the chairman, said he had tried the liquid manure system, not by means of pipes, but by casks mounted on carts, and had found himself amply repaid. He generally did his hay crop with about 4 tons per acre, and as soon as cut he went over it again for the second crop, which was of immense advantage. He had also tried it on lea after two-years' grass, with a like favourable result. His tank for collecting the manurs contained 45 tons, and was 20 feet by 10 and by 8, the cost of it having been £25. In reply to a question from the chairman, Mr. Nisbet said he had tried Garrett's horse-hoe for two years, and had by its use effected a considerable saving in seed, had an earlier harvest, saved a little land, and had immense advantage in having his land kept clean. Last year, out of 60 acres he had left 10 acres unhoed, and the quickens taken off these 10 acres were six times the quantity taken off the 50 which had been hoed. The cost of the hoe was £19. By using two sets of horses, Mr. Nisbet could hoe 20 acres a-day, at a cost of 10d. an acre. His drills were 10 inches, and he drilled along the furrow. He found no difficulty in using the machine, but the fore-steerage could not be dispensed with. The person guiding it had only to direct this, and it kept it all right.

Mr. Wilson, of Edington Mains, was then called on by the Chairman, and spoke as follows:—

Mr. Chairman and Gentlemen—The report which we are now met to discuss, bears upon the face of it that it was upon my own motion, seconded by our esteemed president (whose absence to-day is, on every account, so deeply to be regretted), that it was printed and circulated among us for our mature consideration. On that occasion I expressed it as my opinion that we were much indebted to Mr. Milne for the great pains he had been at in preparing such a statement for our use; and now that I have considered it with care, I am glad to say it is still my opinion that it is fitted, in several respects, to be useful to us, though there are many of its conclusions from which I entirely dissent. I see a good many mistakes, which, if they had been committed by a practical farmer, would have deserved to be pointedly animadverted upon; but knowing as I do that Mr. Milne is not, and does not profess to be a practical farmer, it would be unreasonable and unfair not to make ample allowance for the disadvantage under which his observations and inquiries have been conducted. The report bears to be a description of three cases of successful farming in the south of England. Now, as it is stated upon the authority of the persons referred to, that they obtain a fair return from the business as severally conducted by them, I don't mean in the least to call in question the matter of fact, but simply to ascertain, if I can, to what it is that their success is mainly owing. Let us then consider a little the first instance of successful farming submitted to our notice. Now, it is evident that this is most strictly a suburban farm, and that its management must of necessity differ essentially from that of land in rural districts. If it is to be compared with Scottish husbandry at all, it must be with farms similarly situated. Now, it so happens that I have by me a detailed statement of the whole expenditure on the one side, and of the whole produce upon the other, upon a farm of 400 imperial acres, situated five miles from Edinburgh. I refer to the farm of Woolmet, and quote from a statement published in *Blackwood's Magazine* for January last. I have here nothing to do with the purpose for which that statement was then published, but simply avail myself of it now, as affording me an opportunity of comparing an example of farming in the vicinity of Edinburgh with that described to us by Mr. Milne in the vicinity of Brighton. A glance at these two statements, while showing that the system of management pursued is in fact substantially the same, affords at the same time some most startling discrepancies. The Lothian farmer pays for his land 72s., while the Sussex tenant has his, apparently of as good a quality, for 35s.; the price of manure in Edinburgh seems to be just about double what it is in Brighton—Mr. Gibson's gross outlay for foreign manure being £610 for his 400 acres against Mr. Rigden's £686 for 740 acres; the prices paid for labour by the former are higher than by the atter; the distance which manure and produce have to be carted is five miles in the one case, and but one in the other. They both have the advantage of a lease, but Mr. Rigden's is greatly more favourable for the tenant, allowing him more discretion in the cropping of his farm than is almost ever the case in Scotland, although it seems amply sufficient to secure the landlord against deterioration of his land; and then by the usage of the district, Mr. Rigden has, under the name of 'Mendments,' security for the realizing of a considerable portion of his capital at the termination of his lease, which is unknown with us. It appears further that Mr. Gibson employs fewer horses in proportion to his carriage and mileage than Mr. Rigden—that his general expenses are less than Mr. Rigden's by nearly 20s. per acre—that the capital with which he carries on his business is also less by no less than £7 10s. per acre; and yet that his gross produce is greater by £1 per acre. Let it be observed, further, that the comparison now instituted is betwixt farms situated respectively five miles and one mile from a city. If I had taken farms within one mile of Edinburgh, where the average rent is £5 12s. per imperial acre, it is evident that this single item of additional rent paid by the Scotch farmer (amounting, on 740 acres, to some £2,800) greatly more than absorbs the whole surplus shown in Mr. Rigden's statements; and that, upon the whole, if it be deemed proper that we should take a lesson from suburban farmers, it would be greatly more advantageous to pay a visit to Woolmet than to Hove. The next case cited is that of the Rev. Mr. Huxtable, Sutton Waldron, Dorsetshire. Now, whatever may be thought of the propriety of a minister of the gospel entangling himself with secular business to the extent which Mr. Huxtable has done, I cannot but admire the motive which seems mainly to have influenced him in the outset of his agricultural career, viz., to furnish employment to the farm-labourers of his own parish. Though this case is a very different one from that just mentioned, it is evident that here also the business of farming is carried on under advantages not possessed by us. For, though situated in a rural district, we see that those things which constitute what may be called the raw material of our business, viz., land and labour, are there obtained at a rate very different from those paid by ourselves. It appears that Mr. Huxtable's land costs him from 15s. to 18s. per acre, and that the ordinary wages of able-bodied labourers, in Dorsetshire, range from 6s. 6d. to 8s. per week. Now, though we are told that this land is of a very inferior description, it appears that under Mr. Huxtable's management it yields crops not, in the main, inferior to the two others; for in comparing the statements given in the report of the average produce of the three farms, it appears that Mr. Huxtable's average of wheat exceeds Mr. Morton's, and equals Mr. Rigden's; that his barley exceeds Mr. Rigden's by 10 bushels per acre; and that his root crops are not greatly inferior to either of the others. Now, I would just like to ask, where in all Scotland can you get land at 15s. per acre, capable, *under any management*, of yielding from 30 to 36 bushels of wheat, or 25 tons of mangolds per acre? Indeed, in reading the report, I have been very greatly struck with the difference of the rent in England and amongst ourselves, and still more with the excessive disproportion betwixt the rent of land and the value of its produce, over the arable lands of Scotland. I must also beg leave to express my deliberate conviction, that until this disproportion is fairly adjusted, it is vain to talk of further outlay and improvements, or to expect that things can long continue as they are. In regard to the farm of Whitfield, which is the third one alluded to in the report, the statement is so meagre that we have not materials for comparing it properly either with the two former, or with the modes practised by ourselves. It appears that Mr. Morton conducts his business in a more economical manner than the two others, particularly as regards the number of men and horses with which he works his farm. His produce of wheat, per acre, is less than that of either of the others, viz., 30 bushels, and his root crops being given in the slump, cannot be exactly compared with theirs. His rent, however, is much greater, being (public burdens included) 50s. per acre. Indeed, it appears that when a Scotchman strays into England, his capabilities of paying rent are reckoned upon, and he is amerced accordingly. In comparing our own practice with that described to us in this report, one of the prominent things wherein it would appear that we are greatly deficient is the almost universal absence amongst us of any provision for preserving and applying the liquid manure of our homesteads, &c. Whatever may be done by individuals, I am quite aware of the fact that generally over this district this valuable portion of the manure produced upon our farms is almost entirely lost. While I make this admission, let it be understood that this waste does not arise either from disbelief in the value of the article itself, or from ignorance of the expedients which have been tried or suggested for its application, but simply from the persuasion that they are either too cumbrous or costly to be safely adopted. And so, notwithstanding all that I have seen or heard upon this subject, I am still of opinion that that important problem *of the profitable application of liquid manure* has yet to be solved. It is urged by the advocates of box-feeding that the end is secured by *this system*, as the whole urine is said to be absorbed by the litter. Others have recently spoken strongly of the advantages of using peat charcoal for the same purpose, and then carting it upon the land. We have heard also, to-day, a most interesting account of the plan adopted at Myremill for accomplishing the same end by means of pipes and a powerful force-pump, worked by a steam-engine. This process I had an opportunity of witnessing myself in August last, and, like Mr. Cunningham and his friends, I was certainly most intensely interested and gratified by what I saw at Myremill. Mr. Nisbet, too, has told us that, for several years he has applied this manure in the way he has described, and, as he believes, with a profit. Be it observed, however, that while he states expressly that his oats and grass *appeared* to be better when thus manured, that he has not had recourse to weighing or measuring, so as to be able to set the cost and the profit against each other. I can understand, too, how on such a scale as Mr. Nisbet describes, when all that is attempted is just to save the liquid manure not absorbed by the litter, it may be possible to get such an amount of liquid applied to the land near a homestead, by taking advantage at chance times of the odd horse and boy usually employed for carting turnips and similar work, and so without seriously interfering with the regular labour of the farm. So that, while I don't presume to say that any or all of these plans will not succeed, I just repeat that they have not yet been so accurately and fully tested, as to warrant any prudent farmer in asking his landlord to enable him to try them on a large scale. Even Mr. Kennedy (of Myremill) who has gone into his peculiar plan on such an extensive scale, spoke of it with a modesty and caution which I greatly admired. He, of course, thinks that he will succeed, but does not pretend that this is yet conclusively established. The management of the live stock upon these farms has appeared to Mr. Milne superior to ours in several respects, which he has particularized. In part, I admit this to be true. The system of fattening cattle in boxes, rather than in open yards, is, I believe, worthy of trial, and has indeed been already tried to some extent among ourselves. My own experiments have hitherto been on a small scale, but still I was so satisfied with the result as to have asked and obtained from my landlord the means of trying it more fully. Last winter I had two bullocks put up in this way, and certainly the progress was decidedly more rapid than that of their fellows kept in the open yard. I am also now convinced that Mr. Huxtable's statement of the small quantity of turnips on which he can fatten a bullock is strictly correct. Had I met with it a year ago, I must say that it would have appeared to me incredible, and I don't wonder that others so regard it still. I shall, however, tell you my reasons for believing that his plan of inducing his cattle to eat a large daily allowance of chopped straw promotes their growth, and yet makes fewer turnips suffice. Last spring, being apprehensive that my turnips were to be done before my cattle were fit for the market, I was induced to purchase a straw-cutter; and after trying my cattle with a daily mess of chopped straw, moistened with cold water, in which a little linseed-meal was steeped, I was gratified by finding that half the quantity of turnips which they formerly consumed quite satisfied their appetite, and that their improvement was rather more rapid than before. After seeing this, I was able by reflecting on past observation, to account for this in a way quite satisfactory to myself. I have observed, for example, that when beasts, especially if they are in rather poor condition, are put upon full turnips, they will consume a greater quantity without any proportionate increase: and that even for months, their bowels will be so relaxed as to amount to something like constant diarrhœa—the explanation of which seems to be that when they eat a larger quantity of food, such as turnips, than their system can assimilate, that the surplus does positive harm, and is worse than wasted. On the other hand, I have several times noticed that when I have reserved a heifer or two for breeding, and kept them in the straw-yard with only a single daily feed of turnips, that they have for a considerable time made greater progress than those that were on full turnips. Indeed, sir, I look upon this as the most important point brought before us in this report, and that we shall all find it for our advantage to copy Mr. Huxtable's practice in this particular. The sheep husbandry here described I cannot regard as better than our own. It seems to me that Mr. Rigden keeps his flock at greater expense and trouble than we do; and yet if you set aside what arises from his ram-breeding, his results are inferior to those obtained by many persons around me. His wedder lambs are sold in August at 20s. each, and the wool of his ewes averages 4s. a-head, while from a flock of 350 ewes he only weans 400 lambs, which we all should consider a very poor crop indeed. In regard to fattening sheep, I can quite believe that their absolute increase is greater when fed in covered pens than in the open field, but then it is done at a greatly increased expense. In fact, the enormous cartage employed in first bringing the whole turnips on our farms to the homestead, and then re-carrying the manure a-field, would dislocate our whole existing arrangements, and involve a complete revolution in our management. The expense of all this, as compared with our present plan of sending our shepherd with his flock, nets, and stakes, into a field of turnips, and consuming such a portion as we deem suitable on the ground where they grow, must be very great indeed. By the plan of folding, too, the manure is as equally distributed as by any other, and on light soils the treading of the sheep consolidates the land better and cheaper than any roller yet invented. A good deal is said in the report about the manner in which we keep our farm horses, which is alleged to be more expensive than in various instances quoted both in England and Scotland. Now, I am satisfied that there is a double fallacy here. In the first place, it is assumed, that after deducting the wages of the ploughman from £100—the sum stated as the annual expense consequent upon the keeping of each pair of horses—the whole balance is expended in their food. Now, I have always understood than when this estimate is referred to, it is meant to cover not these two items merely, but also the interest upon the price of the horses, harness, and implements, their annual tear and wear, and the risk of loss. When these are taken into account, and allowance made for the altered price of corn and hay, I believe it will be found that our horses are kept very economically. I admit, however, that it is decidedly better to keep our horses on cut clover, or similar food, in summer, than to pasture them, as is very usually done. And then, in the second place, even though it be true that our horses consume more corn than is given in other districts, we get through our work with fewer of them. There is one part of Mr. Rigden's practice which I consider worthy of our imitation. It is stated that he applies the greater part of the manure in autumn to his crops which are to be sown in spring. I have recently been trying this myself, and know that others have done the same, and think that it may be extended with advantage. In connection with this, I wish to notice an error into which Mr. Milne has fallen, in contrasting the quantity of manure applied on these farms which he describes, with the allowance usually given here. After stating that the manure is applied directly for every crop, and in quantities amounting in the aggregate to 12 tons per acre per annum, on the whole farm, it is estimated that our gross allowance is only from 4 to 5 tons, and that we usually manure for the turnip crop only. Now Mr. Milne has overlooked the fact that while we cart our manure only for the turnip crop, yet as a large portion of that crop is usually consumed on the ground, and as our grass is depastured, we in reality manure directly for at least three crops in each rotation. Besides, I believe that the quantity applied to the turnip crop is on our best managed farms greater than is stated. As select farms are used for comparison on the one side, it is but fair that the same thing be done on the other. I had almost omitted to notice that part of the report where a strong statement is made in connection with the total removal of subdivision fences on these English farms. Now when the smallness of the fields in some parts of England is considered, and the enormous mounds, with all their accompaniments of large timber, brushwood, and weeds, by which they are surrounded, I can quite understand that a wholesale removal of these is a most necessary preliminary to profitable culture; but when fields range from 20 to 50 acres, and the fences consist of a simple line of thorns, I am not prepared to recommend their removal. While our present system of husbandry is continued, I believe them to be positively beneficial to our live stock, and not injurious to crops, unless where hedge-row trees are present. And now, sir, I think I have gone over what appeared most important in this report of Mr. Milne's. I had intended to allude to some other points, but I feel that I have already occupied too much of the time of the meeting, and I am almost ashamed at the undue length of my observations, when I see around me so many of my neighbours, to whom I frankly and cheerfully confess myself inferior both in judgment and experience (Mr. Wilson then sat down amid great applause).

Mr. HAY, of Dunse Castle, alluded to Mr. Wilson's remark about the adjustment of rents, and said that he would never consent to any such adjustment until the tenants first came forward and demanded, as their right, the restoration of protection, which, he contended, was a tenant's more than a landlord's question.

Mr. BUCHAN, of Kelloe, considered the present state of the corn markets the great barrier to the adoption of the improvements suggested by Mr. Milne, many of which might be exceedingly useful.

The Earl of HOME expressed his opinion that such meetings as the present would be carried on with greater satisfaction, if the discussion of political questions were altogether avoided.

The CHAIRMAN then, in a few words, expressed his general concurrence with the remarks of Mr. Wilson, of Edington Mains; and, finding that no other gentleman was prepared to address the meeting, called upon Mr. Milne to make a reply.

Mr. WILSON, however, rose, and begged permission to offer a few words in explanation and vindication before Mr. Milne proceeded with his reply. He said: Certain matters have come up in the course of the discussion, involving the constitution of the club itself. Exception has been taken to the rule of our club, as hurtfully precluding us from entering upon topics of most pressing consequence to ourselves at the present time. Now I know that it was after mature consideration that the rule which declares that no politics shall be introduced at any meeting of our club was adopted; and when it was considered how great are the differences of opinion on such subjects in every community, and among ourselves as much as elsewhere, it appeared evident that only in this way could we hope that our discussions would be conducted with comfort and advantage—in short, that we must either exclude politics altogether, or abandon the prospect of having a useful club. And, sir, if there has appeared on the part of the tenantry present a reluctance to respond to some sentiments which have been uttered, is it to be inferred that our fortunes are unaffected by recent legislation, or that we are indifferent to its consequences? Let the gentlemen of the county, at fitting time and place, take measures for giving expression to our sentiments, and for seeking the redress which we so urgently need, and I can say for myself at least that we are ready to respond to their call. Sir, I am feeling too keenly the pressure of the times to be indifferent on such a subject; but we came here to-day for a specific business, and to that I think it is right to adhere. And there is another thing to which I think it right to refer, after what has passed to-day. I am quite aware, that an impression exists very generally among the farmers of this district that the main drift of the report which we have been discussing, as of other publications which have elsewhere appeared, is just to convey the impression that if we would only farm as well as we ought to do, a reduction of rents would be quite unnecessary. Now I heartily acquit Mr. Milne of such an intention, and do not think it fair to fasten constructions upon his report, which his statements as they stand do not warrant. But at the same time I think it necessary to say that if either landlord or tenant imagines that by adopting such systems of husbandry as have now been described to us, the whole deficiency arising from the altered price of farm produce can be made good, they will soon find that they are under a gross delusion. An improvement is always worthy of trial when there are reasonable grounds for expecting a profitable return upon the outlay involved in it. If it does this it does well. But to expect that, over and above this, any or all of the plans yet suggested are competent to retrieve our altered circumstances, is altogether unwarrantable. Let me say further that the agriculture of this county is not so far behind that of any other in the kingdom, as to leave room for such immediate and decisive advances. I am confident that there is amongst us no backwardness to adopt any practice that can be shown to be really an improvement upon our own; on the contrary that we are even in these depressing times anxiously trying to keep abreast of the most improved modes of the day. We have been, and are now manfully struggling with the difficulties that have overtaken us; and so far from complaining without cause, or yielding to despondency, we are trying to do what we can, and to take as hopeful a view of things as we can. I believe, Sir, that in some measure I can say of myself and my brethren around me, in the words of our great poet—

> "Where an equal poise of hope and fear
> Does arbitrate the event, our nature is
> That we incline to hope, rather than fear,
> And gladly banish squint suspicion."

(Great applause.)

Mr. MILNE said he believed it was a privilege usually accorded to those who originated a discussion to be allowed to reply. He regretted that he should now be called upon so early; for, however deeply gratified he was with what he had already heard, he should have been better pleased if a greater number of the practical members present had given their opinions. But he was bound to thank those gentlemen who had spoken, for the kind and indulgent manner with which they had handled the report before them. On all occasions, the tenantry of this district showed the greatest forbearance—in circumstances peculiarly trying. The fact mentioned by Mr. Wilson, and which he (Mr. Milne) most thoroughly believed, that the tenant farmers of the district were not indifferent to the changes going on around them, and yet had abstained from expressing their feelings at a meeting like the present, was itself a strong proof of their forbearance, and entitled them to the highest respect. He did not wish to enter upon considerations of a political nature, which had been introduced, and in a manner contrary to the rules of the club; but he must make reference to one observation of Mr. Wilson's with regard to the object for which he wrote this pamphlet. Mr. Wilson had done him the justice to exculpate him from having had any other object than what appeared on the face of it. He repudiated the notion that he had any other motive. The question which had been raised by Mr. Wilson, viz., whether it was possible for tenants to go on with their present rents, was a question on which in his report he had not entered, and which he would not now discuss. Unquestionably, if those improvements, the adoption of which he advocated in his report, and which Mr. Wilson approved of, were capable of being generally introduced and acted upon, they would be palliatives; but whether to the extent of forming a remedy for the loss of protection, he could form no opinion. The object for which he brought forward the report was sufficiently stated in several passages, to which Mr. Milne referred—being simply to the effect, that as the practices observed by him were different from and apparently better than those prevalent in Berwickshire, he wished the farmers of the county to be informed of them, with a view to their adoption, if they thought them advantageous. The admirable statements made by Mr. Wilson were worth far more than the document which had called them forth. If his report had done nothing more than elicit these remarks, he thought he had done the club good service in having been the means of putting them in possession of so much valuable information. The first part of Mr. Wilson's address had reference to a comparison of the farming of England with the farming of Scotland. It never was his (Mr. Milne's) object to say that the farming of England was superior to that of Scotland in its general results. On the contrary, it would be found that he bore testimony to the superiority of Scotch husbandry, and had suggested some reasons for the higher rents and greater produce obtained by Scotch farmers. While fully concurring with Mr. Wilson that the results of the farm management he had reported on were, in these respects, not greater than had been produced by many Scotch farms, he was yet certain that there were practices pursued on them different from those in common use in Scotland; he had merely described these practices, and he left it for the Berwickshire farmers to determine whether or not they were superior. He was much gratified to find that he had not deceived himself in this belief; for Mr. Wilson and their chairman had enumerated a variety of practices described in the report, which they fully admitted were capable and deserving of being more generally adopted in Berwickshire. Mr. Milne then alluded to such parts of these practices as had received the approval of Mr. Wilson in his comments on the report, viz., the mixture of food (by chopping straw to mix with turnips), autumn manuring, the house-feeding of horses in summer as well as winter, and the box-feeding of cattle. He also referred to those points on which Mr. Wilson had expressed a doubtful or unfavourable opinion. Mr. Wilson's objection to the feeding of sheep in the homestead all the year round, on account of the expense of carting food to them, and manure from them to the fields, applied with equal force to the feeding at the homestead of horses and cattle, in regard to which Mr. Wilson had expressed a favourable opinion. Mr. Milne then proceeded to defend the system of liquid manuring, the economy of which was doubted by Mr. Wilson, by referring to Mr. Cunningham's estimate, Mr. Nisbet's experience, and several cases in the neighbourhood where it had been advantageously adopted. With regard to the removal of fences from Berwickshire farms, it was a mistake to suppose he had recommended it. So long as the system of pasturing cattle, horses, and sheep, was persevered in, permanent fences must exist; but if all kinds of stock are to be fed at the homestead, which he thought would, ere long, be the case, there would be no need for permanent fences, the great expense of which could not be denied. Mr. Wilson had remarked that, in estimating the quantity of manure laid upon land by Berwickshire farmers, he (Mr. Milne) had taken no account of the manure given by eating off turnips, and by pasturing. He admitted that the criticism was just; but, on the other hand, he considered that very little benefit arose from this mode of manuring. He believed that fully one-half of what was thus dropped upon the surface was lost by evaporation; and any benefit from the other half was counteracted by rankness of vegetation, which, in consequence, the stock would not eat, whilst it caused the oats, in the following year, to lodge, and produced swarms of hurtful insects and worms. Until there was an equal distribution of the manure upon the land, and an incorporation of it with the soil, little or no benefit would be obtained from the practices referred to by Mr. Wilson; and on this account he had in his estimate calculated only what was directly applied to the land for the turnip crop; though he admitted that he should have embodied the explanation he had now given in his report. With reference to the feeding of cattle, he might mention that an experienced and intelligent farmer in this district, a member of the club, had told him a few days ago, that he had fed six oxen in his sheds last summer on cut clover, and other six of the same age and breed on pasture; and that he was satisfied, notwithstanding the greater expense of the first mentioned plan, that it was much more profitable. It was proper also that it should be known, with reference to Mr. Nisbet's testimony, on the subject of liquid manuring, that he had commenced the practice at first on a small scale; and that having become convinced of its expediency, he had at his own expense, without any assistance from his landlord, erected a stone and lime reservoir, arched over with bricks, and procured all the apparatus connected with it. This showed the strength of his conviction. In conclusion, he was glad to find that the general opinion was, that his pamphlet contained suggestions not altogether without value, and it would give him still further pleasure to find that these suggestions were improved upon and adopted. Having expressed a wish that the chairman would embody his idea of the discussion in a practical rosolution, and having again returned thanks for the favourable hearing which he had obtained, Mr. Milne sat down amid great applause.

The following were adopted as the resolutions of the meeting :—

"After hearing the above discussion, the meeting are of opinion that there are several parts of the systems mentioned in Mr. Milne's report which appear to be deserving of a careful but cautious trial, or to be more extensively carried out than they have hitherto been in this district; but that it would not be expedient, or generally practicable, to follow the whole systems of high farming therein reported, particularly as it has been shown that equal results have been brought out by the application of much less capital than is stated to be employed in the cases reported.

"One of the most important of the points contained in the report is the feeding of cattle. The meeting would approve of the more general adoption of feeding in boxes, the trials that have already been made in this district having proved successful, and also because the practice can be adopted with facility and at moderate expense by converting the present buildings into proper accommodation for that purpose. This system has been gradually coming into operation for some years, by the diminishing of the size of the yards, and increasing the size, warmth, and comfort of the sheds, and covering the feeding troughs in the yards. This plan appears to the meeting to be the more worthy of adoption as the cheapest and best means of preserving the manure, both liquid and solid. In the feeding of cattle it seems desirable to induce them to eat a larger quantity of straw than their inclination would lead them to, when it is newly given to them in racks in the usual way; and this can be effectually done by chopping the straw, and moistening it with a mucilage prepared by steeping linseed meal in cold water, and not to give the full quantity of turnips the animals would be inclined to eat: by this means they feed more readily, and of course a greater number may be kept. The soiling of cattle in the house in summer, to a certain extent, may also be desirable.

"It is the opinion of the meeting that nothing has been shown to warrant any essential departure from the present mode of the management of sheep followed in this district.

"In the feeding of horses it appears to the meeting that soiling in the house or yards in summer is preferable to grazing in the fields.

"In reference to the statement in Mr. Milne's report, that horses are kept at a greater expense here than elsewhere, it is the opinion of the meeting that this is not the case, particularly when it is considered that in this district the work of the farm is performed with fewer horses in proportion to the acreage than those instances with which it has been contrasted. The sum of £100, referred to by Mr. Milne, as the common estimate of the expense of keeping a pair of horses in Berwickshire, includes not only the wages of the ploughmen and food for the horses, but also the interest of the money expended in the purchase of them, the harness and other implements which they are to work, the annual cost of keeping them in repairs, and the deterioration in the value of the horses from increase of age, &c. When these items are taken into account, and allowance made for the diminished price of provender, the estimate will be found to be as moderate as any of these cases described by Mr. Milne.

"A favourable opinion is entertained by the meeting of Mr. Rigden's practice of autumn manuring to a certain extent.

"The meeting cannot approve of the substitution of wattles for fences of the large and open fields of this district; but in an agricultural point of view would recommend the diminution of hedge-row trees.

"The meeting again acknowledge the obligation the Club owes to Mr. Milne for the trouble he has taken in drawing up his Report, and for the zeal he has shown in bringing before it the most recent systems for discussion."

Dr. Hood, of Whitecross, then proposed a vote of thanks to the chairman for his conduct in the chair, which was carried with much applause, and the meeting separated.

THE AGRICULTURAL DISTRICTS OF ENGLAND.

FROM THE TIMES' COMMISSIONERS.

(Continued.)

LINCOLN.

The county of Lincoln presents many features of interest to the agriculturist. It embraces a great variety of soils and modes of cultivation, varying from the richest pastures to the most sterile sands, and exhibiting on its various soils the treatment which experience has taught in the management of stiff clays, fens, warp-land, sands, wolds, and heath. In this county, too, has chiefly risen into prominence that system of compensation to the outgoing tenant for unexhausted improvements, which is believed by many to have been the foundation of the agricultural progress of Lincolnshire. Entering the county from the south, an extensive district of fenland, described in our last letter, is traversed, reaching up to the city of Lincoln, where, on the summit of the hill, rise the towers of the stately cathedral. At this higher level, some 150 feet above the vale, stretches a tract of dry turnip land running north and south of the city about 40 miles, and still known as Lincoln-heath. Nearly parallel with this, but separated from it by the great central vale of the county, lies the district called the Wolds, and between that and the sea extends a tract of richer and heavier land. On the north-western boundary of the county, on both banks of the Trent, is that low-lying tract of land on which the peculiar process of warping is carried on. The fen lands we have already described, and purpose now to enter into some details of the present state of agriculture in the wold and heath portions of the county, and then to give a very brief description of the process of warping and its effects.

The system of husbandry general throughout the district is the four or five course. This will no doubt come to be modified by the change which railway accommodation will afford; this county, which was formerly somewhat remote, being now covered with a network of railways, giving ready access on the one side to the seaports, and on the other to the great central markets for agricultural produce for supplying the dense population of the manufacturing districts. Taking the line of country traversed by the railway from Lincoln northwards by Market Raisen and Caistor, the land is generally very insufficiently drained, and by no means well managed. On the stiffer clays little seems to have been done in removing the stagnant water; the grazing lands being much covered with rushes, and the fallows, on the land in cultivation, being foul and out of condition. Approaching Caistor, a large extent of weak sandy soil is passed, on part of which a very great improvement has been effected by claying. We were favoured with some interesting information by the gentleman who commenced the practice—Mr. Dixon, of Holton. Twenty-two years ago, when he came into possession of the estate, there were 500 acres of rabbit-warren, which the tenant refused to hold at a rent of £50. He took it into his own hands, and by covering it all with clay, and by under-draining, he now considers the same land worth 16s. an acre, or £400 a-year. The expense of claying varied, according to the distance from which the clay had to be carted. In some cases it was got in pits in the field where it was applied; but in general it had to be brought from spots at a higher level than the sandy tract. There, beneath the surface, beds of whitish marly clay, mixed with chalk and flints, are found four or five feet in thickness. These are opened out like a quarry, and the face is wrought down by pick and shovel. It is then filled into carts and conveyed to the sand-land, where it is laid on at the rate of 60 yards an acre. It is usually laid on land in preparation for green crops, where, after being exposed some time to the action of the weather, it breaks down and mixes with the sand. The whole field is at the same time under-drained with tiles, the cost of both operations averaging from £12 to £14 an acre. After the field has been green-cropped, and when the subsequent barley crop has been removed, 30 yards more of clay are spread over the seeds, the whole dose being thus 90 yards an acre, not applied all at once, but in two separate applications. The effect of this mixing of soils has been to convert a weak sand, unfit for the production of any valuable crop, into light land of fair quality, on which by good farming clover, wheat, turnips, and barley, may be taken in regular succession. The quality of the clay should not be overlooked, as it is highly calcareous, and is probably not often to be found in proximity to tracts of sand. A different description of clay, more unctuous and of a black ferruginous character, was tried by Mr. Dixon, and, instead of proving beneficial, was very injurious. Beyond Mr. Dixon's estate this tract of sandy land seems, with few exceptions, to be badly managed.

The strong clays are by no means so well managed in Lincoln as in Essex and Suffolk. In executing drainage it is common for the landlord to supply tiles, and the tenant to put them in; but a great deal yet remains to be done by both. The old form of raised ridges is still maintained, from the difficulty experienced on this kind of land of levelling them down without injury to the surface. The best soil on the top of the ridge, when levelled into the hollow, exposes a barren subsoil, which requires many years' exposure to the air and to the influence of manure before it becomes fertile. Where the land is well drained and carefully tilled it yields large crops. The usual succession is clover or seeds, wheat, turnips, barley, fallow, wheat or oats sown down with seeds. It being common to hold a quantity of grass land along with a clay land farm, the farmer is enabled to keep a considerable stock, which, when wintered in his yards on cake, converts his straw into valuable manure. The rent of this description of soil, like that of all others in this county, varies more according to the character of the landlord than its intrinsic qualities. On Lord Yarborough's estate the clay farms, which are close to a line of railway, and where the landlord gives tiles for drainage without any other charge than that the tenant must put them into his land, the rent varies from 18s. to 22s. an acre, tithe-free, and the poor-rate is very moderate.

Ascending from the clay lands to the Wolds, we enter on that tract of country which, with the heath, to be subsequently described, has given celebrity to the farming of Lincolnshire. It is situated on the chalk formation at about the same elevation and of much the same character as the land round Holkham, in Norfolk, but much lower and less exposed than the Down farms of the southern counties. This tract, extending to more than 200,000 acres, varies considerably in quality, being best where it dips to the lower ground, and very light and sandy towards its highest points of elevation. The rent of the best land rises as high as 32s. an acre, and the average is 20s., titne free, and with very low poor rates. The mode of culture is the four or five course, the seeds remaining one or two years down. On one of the better-managed farms on the Wolds the following is the routine of cultivation:—Beginning with the turnip crop, the land, after being properly cleaned and wrought, is sown with yellow and white turnips in succession, I cwt. of guano and 4 bushels of dissolved bones per acre, mixed with ashes, being drilled in before the seed. The crop is consumed on the ground by sheep, which get no cake unless the turnip crop proves very inferior. If the crop is good, part of it is drawn for consumption in the yards by cattle. It is succeeded by barley, a small proportion being in some cases sown with wheat. The barley is followed by clover and seeds, on which the sheep are turned very early in spring, there being no other provision made for them; and, *as swedes are seldom or never grown*, the yellow and white turnips do not stand late in the season. It is not usual to give any of the sheep stock cake on the seeds, except ewes with twin lambs. The seeds are ploughed in autumn, after being dunged with yard manure, which many farmers prefer applying the previous winter, that the seeds may be benefited as well as the wheat. The wheat is then sown in the usual manner. The straw-yard cattle are seldom fed fat, being principally stores, kept through the winter in fair condition, on 4lb. per day of oil-cake, and sent down to the richer grazing lands which most Wold farmers hold in the low country, to be fed during the summer. The sheep stock is Leicester or improved Lincoln, a breeding flock being kept, and the produce sold at two years old, seldom earlier. The result of this management is an average crop of 26 to 28 bushels of wheat per acre, and not much more of barley. The reader who has perused our reports from West Norfolk must be struck with the difference of management in the two districts. The alleged impossibility of growing swedes advantageously here will be at once referred to the very scant supply of manure applied to the turnip crop. We should not expect a good crop of swedes in any other district with no more enriching application than 1 cwt. of guano, and 4 to 8 bushels of dissolved bones per acre. One farmer grew last year a quantity of swedes for the first time (four or five acres in upwards of 100 acres of soft turnips), and, having manured the land with dung, in addition to the above quantities of artificial manure, he succeeded in getting a good crop. This year he intends to grow 20 acres. One is surprised that this discovery has been only now made for the first time. Nor is the cultivation of the land attended to with anything like the same neatness and care which distinguish the best farmers in West Norfolk. It is permitted to get foul, and the same minute attention in the extirpation of weeds from the corn and grass fields is not here observed. The land is chalked as often as it appears to require it, perhaps once in 20 years, the want of it being shown by the appearance of the disease in turnips called "fingers and toes," for which chalking is a perfect cure. Four horses are often used in a plough, but it is a two-furrow plough, turning over at this season of the year three acres a-day, and usually managed by one man without a driver.

Leaving the Wolds, and re-crossing the central plain, we arrive at the heath farming. This is part of the great tract of land on the lower oolite formation which commences at Bridport, in Dorsetshire, and runs in an unbroken chain through Gloucestershire, Oxford, Northampton, Rutland, and into Lincolnshire. It is a dry reddish turnip soil, varying from a few inches to a foot or more in depth, lying on a porous calcareous rock. Here the style of farming very much resembles that of the Wolds, only that the crops are somewhat more generously treated. In feeding turnips or seeds, however, cake is very seldom given to any of the sheep stock, except ewes with twin lambs. Top dressings for the corn crops are quite uncommon. A well managed farm of 500 acres will winter 1,000 sheep on turnips. Swedes are successfully grown here. The favourite breed of sheep is the improved Lincoln, which clips from 7lb. to 8lb. of wool, and weighs at two years old 30lb. a quarter. This is a strong-necked sheep, differing in that respect from the pure Leicester, and producing more lean meat than that breed. In the yards the cattle receive cake during the winter, some farmers feeding them fat, others keeping them as stores. Half a ton of oil-cake per head is the largest quantity expended by the best farmers. In sowing wheat after clover, the land after being ploughed is first well harrowed; the seed is drilled, then covered by the harrows. The land is then rolled and harrowed again after the roller. On the better land wheat is usually sown after turnips up to the beginning or middle of March, "Hunter's white wheat" being the variety found most productive. Hornsby's drop drill is much used for sowing the turnip seed and manure together. Great benefit has been found by ploughing deep in the heath land with a subsoil plough, thus bringing up broken calcareous rock, and at once deepening and manuring the soil. The wheat is built in lofty oblong stacks, containing 60 or 70 quarters, and a great deal of labour is expended in carrying these up very high, and in thatching, and finishing them off neatly. The rent is about 20s. an acre, no tithes, and rates low. The better class of land near Lincoln lets at 30s. an acre, but rent is scarcely thought a criterion of value, as some landlords let better land at 20s. than others let at 40s.

The farm-buildings on the better class of farms in Lincolnshire are superior to most we have met with in the more southerly counties. On the estate of Mr. Chaplin, of Blankney, many very substantial and complete ranges of buildings have been and are being erected.

A good idea of the process of warping may be got by sailing up the Trent from the Humber to Gainsborough. The banks of the river were constructed centuries ago, to protect the land within them from the encroachments of the tide, or rather to exclude the tide from the land, which was left dry at low water. A great tract of country was thus laid comparatively dry, the tide rising every day within the embankments several feet higher than the cultivated land. The wisdom of one age thus succeeded in restricting within bounds the muddy tidal waters of the river. It was left to the greater wisdom of a succeeding age to improve upon this arrangement, by admitting these muddy waters to lay a fresh coat of rich silt on the exhausted soils, and so to restore them to their original fertility. The process began nearly a century ago, but has become more of a system in recent times. Large sluices of stone, with strong doors to be shut when it is wished to exclude the tide, may be seen on both banks of the river, and from these great drains are carried miles inward through the low country to the point previously prepared by embankment, over which the muddy waters are allowed to spread themselves. These main drains being very costly are constructed for the warping of large adjoining districts, and openings are made at such points as are then undergoing the operation. The mud is deposited, and the waters return with the falling tide to the bed of the river. Spring tides are preferred, and so great is the quantity of mud that from 10 to 15 acres have been known to be covered with silt from 1 to 3 feet in thickness during one spring of 10 or 12 tides. Peat moss of the most sterile character has been by this process covered with soil of the greatest fertility, and swamps which, in the memory of our informant, were resorted to for leeches, are now, by the effects of warping, converted into firm and fertile fields. Near the mouth of the river the water is muddiest, and the process can there be more easily accomplished; but sluices are seen for nearly 30 miles up the Trent, so that even at that distance from the Humber the water has not entirely lost its fertilizing particles of mud. The expense of warping varies from £15 to £21 an acre. After the new land has been left for a year or two (in clover and seeds) it produces great crops of wheat and potatoes.

(To be continued.)

AMERICAN CHURN.

Sir,—You are aware that the first autumnal show of the Lower Annandale Agricultural Society took place at Annan on the 4th curt., and that, in order to increase the interest of it, I procured, for exhibition, one of the Patent American Churns, of the success of which we have had very conflicting accounts, and that in order to give effect to the wish expressed by the judges of implements, I announced my intention of having a competition with it and two other churns on the following day. This took place accordingly.

The competition was attended by Mr. Smith, of Blackwood House, Mr. Elliot, Hardgrave, and Mr. James Moffat, Kirtlebridge, members of the Society, the two latter gentlemen each keeping notes of the different particulars. We had also the advantage of the presence of several ladies, who attended in the dairy during the whole time, and who afterwards very materially assisted in our coming to what we considered a correct and dispassionate judgment as to the merits of the American or Anthony's Churn.

The churns with which it was compared were, 1st, the Common Box Churn of the district, used at Blackwood House; and 2nd, an Atmospheric Churn, made by Robinson, near Belfast, which churn was also exhibited at Annan, and has been used at Newlands for some years. Every requisite preliminary arrangement having been previously made by my direction, 90 quarts of cream were put into the Belfast churn, and 5 quarts of warm water added to raise the temperature of the cream to 62 deg. Fahr. thermometer. The cream was then minutely mixed by turning the handle of the churn several times round, and 12 quarts of the mixture were put into the American churn, 12 into the common box churn, and the remaining 71 were left in the Belfast churn, the temperature of them all being kept at 62 deg. The two smaller churns were filled up within a little of the axletree, being the limit thought best for them, and the three churns were intended to be turned at the ordinary rate, according to the size of the handle—the Blackwood House 90 revolutions in a minute, the American 80, and Belfast 85. The first made the butter in 20, the second in 26, and the last in 48 minutes; the first producing 6¼ lbs. of butter, the American the same quantity of 6¼ lbs., and the Belfast, from 71 quarts, producing 39 lbs. 11 oz., or a fraction above 6 7-10ths lbs. to the 12 quarts. The butter was then made up and brought into the house, half-a-pound of each on three different coloured plates, and marked besides No. 1, 2, 3, by my farm servant, who alone was cognizant of the application of the numbers to the different churns. Each portion was then tested in various ways by the whole of the large party present, who *unanimously* decided that the butter made by No. 3 was very good, that by No. 1 rather better, and that by No. 2 the best. On reference to my servant's private note, No. 1 was from the Blackwood House churn, No. 2 from the American, and No. 3 from the Belfast one; No. 2 being at least equal in point of flavour, and decidedly superior in firmness.

A discussion was then instituted as to the relative quality of the different churns for use, when it was again *unanimously* agreed that the superiority of the butter made by the American churn would more than compensate for the greater quantity made by the Belfast churn, provided a market could be obtained for it, where a price would be given according to its quality; but that, in a country district, where little difference of price existed, perhaps the Belfast one might be considered preferable. The buttermilk was also tested under similar precautions, when it was again unanimously agreed that No. 2 was the richest and best, No. 1 the next, and No. 3 the last. The cost of the American churn, which was kindly forwarded to me by Messrs. R. Gray and Son, Uddingstone, Glasgow, is £2; but Mr. Elliot seemed to think that if made of common wood, and ordinary workmanship, it could be made at little more than half that sum.

On Tuesday, the 8th, there being only enough of cream for one churn, and the dairywoman being again anxious to use the American churn, she put 13 quarts of cream in, instead of 12, with 2 quarts of warm water, which brought it to a temperature of about 61½; the mixture she, however, considered richer than on the former trial. She did not churn quite so fast, it requiring 36 minutes to produce the butter, which amounted to 7½ lbs., extremely well flavoured, and remarkably firm. The dairymaid seems to consider that, on the whole, the churning on the 5th was a little above their usual speed, and that, from the Belfast churn being so much larger, and the time allowed for its butter to harden scarcely commensurate with the extra quantity, its being a very little softer than the others can be easily accounted for, as she never knew it to happen before at this season of the year when churning at their ordinary speed, taking often from one to nearly two hours. She, however, summed up all by saying that if she had a small dairy of her own she would undoubtedly use a churn upon the principle of the American.

In as far as this competition went, it is obvious that the palm of victory must be awarded to the American churn; but it is quite evident to me that, notwithstanding all that has been written upon this very important subject (the management of dairy produce), due attention is by no means paid to the various details necessary to be attended to, in order to produce the most beneficial results, and particularly with regard to experimenting with cream at various degrees of temperature; for I am well aware that in some dairies of 15 cows and upwards, a thermometer forms no part of the plenishing of the dairy, those in charge contenting themselves, in the true "canna-be-fashed" style, with feeling satisfied that "they can aye guess gye near the bit."

I am, sir, yours faithfully,

NORMAN LOCKHART.

Newlands, 10*th Oct.*, 1850.—Dumfries and Galloway Courier.

LONDON FARMERS' CLUB.

MEETING OF THE COMMITTEE OF MANAGEMENT.

DEC. 9, 1850.

Present: Messrs. W. Bennett, W. Cheffins, W. Fisher Hobbs, C. W. Johnson, T. Knight, J. J. Mechi, J. Pain, and W. Shaw.

W. FISHER HOBBS, ESQ., in the Chair.

The minutes of the last meeting were read, confirmed, and signed by the chairman of this day.

The following gentlemen were elected members of the club:—

J. L. Baldwyn, Poolmeyrick Lodge, Chepstow
F. Barlow, Burgh, Woodbridge, Suffolk
W. H. Barwell, Northampton
E. Brown, Harewood, Leeds
R. Caparn, Holbeach, Lincolnshire
J. Curling, Gosmore, Hitchin
J. Ferrabee, Stroud, Gloucestershire
W. Newbold, Braginton, Coventry
T. E. Pawlett, Beeston, Biggleswade
J. Russell, the Wyelands, Chepstow
W. Smeddle, the Tower of London
T. Waters, Winchester
C. Watts, Kislinbury, Northampton
S. Weston, Bird's Isle, Tenterden
G. Worle, Ulwell, Ely.

The names of some other gentlemen proposed as members were read for the first time.

The report from the committee for the general meeting was prepared.

A list of subjects proposed for discussion was read, and the selection postponed to the January meeting of the committee.

The subject of the following resolution, of which notice had been given by Mr. Pain, was then brought forward:

"That the committee of the Farmers' Club proceed to consider the state of the tenant farmers throughout Great Britain, with a view to suggest what relief can be given in their present depressed condition."

The discussion of this question was ultimately adjourned, and some other business despatched, and the committee broke up.

GENERAL ANNUAL MEETING, Thursday Dec. 12.

W. SHAW, Esq., of the Strand, in the Chair.

The following report from the Committee was read by Mr. Corbet, the secretary, and on the motion of Mr. Page, of St. Albans, received and adopted:—

REPORT OF COMMITTEE, Dec. 9th, 1850.

After a year of such unprecedented trial to the agriculturist the Report from the Committee of a Farmers' Club may be looked to with something more than usual interest.

In presenting this return of the year's proceedings, although the Committee cannot naturally speak in that altogether satisfactory tone they have hitherto been justified in using, they are still happy to announce that the London Farmers' Club has not retrograded. If during the last twelvemonths the number of new Members does not equal the average of the two or three preceding years, these are still amply sufficient to counterbalance such parties as in the ordinary course of things have ceased to be Members. To this test of strength the Committee may add that they have this day elected for the ensuing year more new Members than they have at any one meeting for a long period—a fact sufficient to show that the object and usefulness of the Club are more and more appreciated.

As regards perhaps the most important feature in the proceedings of the Club—namely, the Discussion Meetings—the Committee have only to say that they will if possible give more than ordinary attention to the selection of subjects, well aware as they are how difficult it is in these times to insure a good attendance without the matter considered be one directly influencing the condition of the farmer.

In conclusion, the Committee have but to assure their friends, as they fully believe themselves, that to the majority of those engaged in the pursuits of agriculture, the use of the Farmers' Club may be found both a convenience and an advantage.

The following members of the committee went out by rotation, all of whom were subsequently re-elected:—

Messrs. Fisher Hobbs, W. Hutley, T. Knight, E. Lewis, J. Oakley, T. Owen, W. Purser, J. Smith (of Rye), C. Stokes, Owen Wallis, Jonas Webb, and W. Wingate.

Mr. Spencer Skelton was elected a member of the Committee to fill up the vacancy caused by the death of Mr. W. Spearing.

Mr. W. Bell, Mr. T. Barker, and Mr. E. Purser, were re-elected Auditors, and a vote of thanks was passed to them for their services.

A discussion took place on the subject of Mr. Pain's motion, already given in the proceedings of the committee, and again referred to at the dinner, after which the meeting broke up, having passed a vote of thanks to the chairman.

THE LONDON FARMERS' CLUB.

THE QUALITIES OF DIFFERENT KINDS OF FOOD, AND THE BEST METHODS OF FATTENING STOCK.

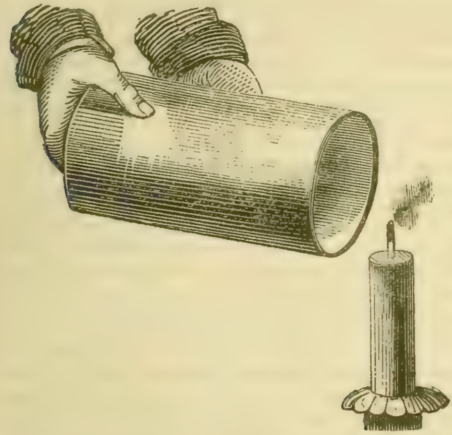
The usual monthly meeting for discussion took place at the Club-rooms, Blackfriars, on Wednesday evening, Dec. 11; Mr. J. Payne, of Felmersham, in the chair. Subject: "The qualities of different kinds of food, and the best methods of fattening stock;" introduced by Mr. J. C. Nesbit, F.G.S., H,C.S., &c., of the Agricultural and Chemical School, Kennington. London.

The Chairman said that, as an humble individual, who was in the habit of feeding a few animals, he considered the subject for discussion very important. Remembering that they sold their present stock at a considerable sacrifice—(Hear, hear)—it was, in his opinion, essential that they should know how to feed at the cheapest rate (Hear, hear). He hoped Mr. Nesbit would be able to enlighten them on that point. The subject was one on which there might be much diversity of opinion; but this at all events was certain, that if any plan could be pointed out by which they could produce beef and mutton at a cheaper rate, all who were producers would be most happy to adopt it.

Mr. Nesbit then said: Mr. Chairman and Gentlemen,—The subject for discussion this evening I find to be "On the Properties of different kinds of Food, and on the best Methods of Rearing and Fattening Stock." Of course it will be necessary, in speaking of the best methods of fattening stock, to take into consideration all the points whereby gentlemen who keep stock may lose —whereby they may find a deficiency in the year's accounts. Now I shall not be able at all to enter into the question of the markets—of the buying and selling of animals—but I shall endeavour, in opening the discussion, to bring under your notice the principles on which I think most parties who have studied the subject—and I dare say most parties here—will admit that the fattening of animals depends; and I shall endeavour to point out all the cases in which loss may arise, whether from the use of improper food, or from the want of good ventilation. You will please to understand that I can only bring under your notice the principles. I must labour to show you upon what the fattening and the growth of stock depend, leaving it to you practical gentlemen to put these principles into proper and efficient action. Now, I must speak first of the constitution of vegetables, and of general vegetable growth. We find that your vegetables are not like those with which nature clothes the fields. If you leave the bare surface of the land to the action of the atmosphere, and to those causes which are constantly operating, you will find Nature clothing the field with plants of her own choosing. But you have to grow plants selected from the whole mass of those which have been presented to you by Nature. You select certain plants for the purpose of obtaining the largest quantity of those substances which are useful for the support of animal life. In doing this you reject the ordinary offers of Nature, and you come in, as it were, to her assistance—you make use, that is, of her powers with the assistance of Art. Of course, you know very well that it is quite necessary that there should be a total change in the land when you proceed to cultivate plants differing from those which are produced by it in its natural state, and to secure this you add manures, so as to raise up the produce of land to the highest amount. The action of your vegetables upon the land and upon the air is this, that you absorb the saline materials with the roots of the plants—that these are taken up into the plants themselves. When the sunlight acts upon the leaves of those plants, they have the power of absorbing various ingredients from the air, and also of assimilating them together with the materials brought from the soil by the roots. You find continually going on a separation of some materials, and an addition to and secretion in the body of plants of other materials. Now, what are the substances which plants take from the atmosphere and the soil? We find those taken from the soil are chiefly mineral ingredients, such saline materials as would be found in the ashes of the plants if they were burnt. You have bone-dust, potash, soda, lime, and various other matters. The organic ingredients of plants, viz., oxygen, hydrogen, nitrogen, and carbon, are generally derived by plants by the action of the leaves on the air; but when you manure your land with common manures, you always have the roots of the plants taking up these substances from the soil as well. These are taken up by the roots of plants, though in the wild state of nature they are generally taken up by the leaves only. By manuring your land you secure double the growth or double the action that there would be otherwise. When these materials are presented to the action of the light by the leaves of the plant, they are assimilated—a portion of the oxygen being continually sent forth; for the whole process of the life of a plant consists in taking up the carbon, hydrogen, nitrogen, and oxygen, retaining the three first and continually casting out the oxygen. In many plants you have substances containing not a particle of oxygen; for example, many of the essential oils, as otto of roses. You will please to recollect, then, that during growth the plant is employed in casting out oxygen; which is, however, the vital air required by animals. Now, having mentioned the process which is taking place continually in plants, I shall be able to show you that for the support of animal existence, the different vegetable products may be divided into two classes, having distinct properties. I have mentioned the four materials—carbon, hydrogen, nitrogen, and oxygen. In all the substances that are adapted for food, oxygen is still present; it has not been totally cast out. We have, therefore, these four elements both in animals and in vegetables. We find that the common principles found in vegetables resolve themselves into two classes; one of them destitute of nitrogen, and the other containing nitrogen. Now, those substances which contain no nitrogen may be called the non-nitrogenous elements of food, and these are the elements of respiration and the producers of fat. I shall now proceed to show you the nature of these bodies, and also their uses in the animal economy. Those bodies in vegetables which contain no nitrogen are, fat of any kind whatever, oil, starch, gum, mucilage, and various kinds of sugar. These bodies, I say, contain no nitrogen. They are merely adapted for the produce of fat, or for the purposes of respiration. It is necessary to explain to you, gentlemen, that these materials are of use in keeping up the animal heat. We keep up the heat of our bodies by continually applying fuel—that is, food containing charcoal and hydrogen, and passing through our system the air taken in by the lungs, which air acts upon the combustible parts of our food precisely as in our lamps and our gas lights, where we burn carbonaceous substances by currents of air; so in our own systems, and in the systems of all warm-blooded animals, there is a considerable portion of food consumed for the mere purpose of keeping the temperature of the animal elevated above that of the air in which it exists. The portions of the food of animals which are used for this purpose are those which I have mentioned. They contain no nitrogen whatever; they add nothing to the *nutritive* powers of food; they could not enable any man to take a greater amount of exercise than usual; in no way do they add to the building up of the organism. They are used, in the first place, to supply the fuel for heating the body. By every inspiration we take in a considerable amount of oxygen. That oxygen acts upon the carbon and upon the hydrogen of these non-nitrogenous materials, and passes out again in a consumed state. Let me here mention the amount of carbon consumed each day by various animals. Man consumes, on an average, from 12 to 14 oz., and there is required for that consumption 37 oz. of oxygen; the horse consumes 97 oz., and requires 258 oz. of oxygen; and the cow consuming 70 oz. of carbon demands 186 oz. of oxygen. You will, therefore, clearly see, that our animal economy requires that a constant supply of heat-producing materials should be brought into the system, and that a continual supply of oxygen should be taken in by the lungs, in order that the body may be kept at a proper temperature. Now after the temperature which is necessary for the animal economy has been arrived at, you have left the excess of food beyond what the animal requires for heating purposes. What remains of the starch, the oil, the gum, the mucilage, and the sugar, after the necessary production of heat, is formed into fat? This excess of food is by nature placed upon the muscles in the form of fat, in order that if the animal subsequently be, by any misfortune, deprived of food, the days of its feasting may in some measure administer to the necessities of the days of fasting. You see, of course, that under such an arrangement it is essential, for fattening purposes, that the animal should be kept at a proper temperature; otherwise no fat can be formed from these materials. This is one of the points which it is necessary continually to keep in view, as it will be found of material importance in its connection with practice; for you will see that the variations of the different amounts of food required by animals will depend in a great measure upon temperature. In proportion to the temperature which an animal has to keep up, or rather in proportion to the degree of cold to which it is exposed, will be the loss of the materials consumed in keeping up the animal heat. Therefore warmth is always equivalent to food. The less animals are exposed to cold and wet, the less will the elements of respiration be required to produce the necessary animal heat, and the more food will be left for the production of fat. Therefore it is of immense practical importance to the pocket that fattening animals should be well-sheltered and kept warm. I shall not now dwell on this point, as I intend to advert to it again. You will find what I have just said clearly illustrated by the different kinds of food required by men in different parts of the world. Observe the difference between the food required by the Hindoo in the tropics, and that required by the Esquimaux in the arctic regions. The Hindoo lives on rice, which contains a very small amount of carbon and hydrogen—the producers of heat—as compared with the fatty matters which are consumed by the Esquimaux. The Hindoo is content with a small amount of rice and milk every day, whereas the Esquimaux will eat two or three pounds of candles, and drink a quart or two of train oil at once without experiencing any ill effects. An Esquimaux will even drink a quart of brandy without suffering any injury; and it is because the native of the northern climate consumes such large quantities of fatty substances that he is able to go almost naked, notwithstanding the utmost rigour of the climate. He consumes such a large amount of the heat-producing elements, being in the habit of eating, when he can get it, 8 or 10 pounds of whale blubber per diem, that a difference of 20 or 30 degrees in the temperature of the atmosphere is of very little practical importance to him. On the other hand, you find that in warmer climates men not only require a less amount of heat-producing materials, but if they take them into their system they are thrown by them into bilious diseases; and if they subsist upon them to a considerable extent in the hottest weather, they soon cease to exist. I shall now refer to the nitrogenous elements found in food. These are the real elements of nutrition; they are the producers of flesh, and they must be kept perfectly distinct in our minds from those substances which merely produce fat. Among the producers of flesh we have vegetable fibrine, the gluten of wheat, albumen, and vegetable caseine. If you take the turnip and press it you will have the fibrine or gluten in the pressed mass, while the juice will contain the albumen and caseine. If you take this juice and boil it you will have a coagulum of albumen precipitated, exactly as if you had used the albumen or white of an egg. If you separate it by filtration, and then add an acid to the filtered liquid, you will have another precipitate, similar to that which goes down from milk on the addition of rennet or an acid, and similar in all its relations to the curd of milk. This, which goes down last, is called caseine, because it is precisely similar to the curd of cheese. That which goes down by boiling is called vegetable-albumen, because it is like the albumen of an egg, and that which remains insoluble in the pressed mass is called vegetable fibrine or gluten. These three substances differ and agree in the following manner:—The fibrine or gluten is insoluble in water; the albumen is soluble in water, but is coagulated and precipitated on boiling; and the caseine, or cheesy principle, is soluble in water, not precipitable by boiling, but separable on the addition of an acid, such as rennet or vinegar. The most important fact has yet to be mentioned, namely, that these bodies are almost identical in composition; and that also they are of the same composition as the flesh of animals in general. We shall, therefore, clearly see that vegetables produce the staple of flesh, and that animals merely alter its mechanical structure and condition. Now you will please to observe the extraordinary importance of these bodies. Vegetable albumen is similar to, if not identical with, animal albumen—the white of an egg. Now, see what a very little thing will change the white and yolk of the egg into totally different substances. You have only to take the egg, with its principle of vitality, and to expose it to a certain temperature for about three weeks, and you obtain bones, sinews, muscle, claws, beak, eyes, feathers, nerves, lungs, liver, intestines, and the various other parts of the animal economy. All these products come from these apparently simple substances, merely by the action of the principle of vitality. In the same manner when vegetable fibrine and casein get into the animal system and are operated upon by the vital functions, they are dissolved and distributed through the various parts to form the different bodily organs required by the necessity of the animal. I will refer you here to some analyses, which have been made by various distinguished chemists, of the gluten, caseine, and albumen obtained both from vegetables and from animals:—

	Carbon.	Hydrogen.	Nitrogen.	Oxygen.
Vegetable gluten ..	54.2	7.5	13.9	24.4
Vegetable caseine ..	54.14	7.16	15.67	23.03
Albumen, or white of egg	55.0	7.07	15.92	22.0
Vegetable albumen	55.16	7.05	15.96	21.81
Ox flesh..........	54.18	7.93	15 71	22.18
Ox blood	54.35	7.50	15.76	22.39

There is the greatest similarity between these substances, whether obtained from the vegetable or from the animal. Now it is impossible to imagine that these materials, so nearly agreeing in their composition with flesh, can be changed at all in composition when taken into the system; that they can, when there, receive any addition either of carbon or of nitrogen. There can be no doubt whatever that vegetables produce the flesh of animals; that the flesh of all animals has been prepared and made originally by the vegetables themselves; and that animals dissolve the already-prepared matters, and under the action of vitality give them a different mechanical form, and put them on the muscles of the body. We have no reason to believe that the stomach of the animal acts upon these matters in any other way than by solution, the vital force afterwards putting each particle into its proper place in the system. Now these nitrogenous matters are the real sources of nutrition. These are the producers of flesh; these substances, the fibrine, the albumen, and the caseine, are those from which we derive our muscles. If an animal were fed upon the elements of respiration alone—upon fat, oil, starch, gum, or sugar—it would be perfectly impossible for it to grow, to work, or to live. If a labouring man were fed solely upon non-nitrogenous food, he would soon die: no human being could exist on such substances. Arrow-root, starch, and all things of that kind, by themselves, are insufficient to sustain life; they may do very well to produce animal heat, but it would be perfectly impossible to live on them alone; they must be united with other materials containing nitrogen, which alone can supply the daily waste of the muscles. Every motion which an animal makes with any muscle causes a proportionate destruction of that muscle. At the time he makes the motion the oxygen attacks the muscle and dissolves a portion of it, equivalent to the amount of motion and force produced. Now this is a method of heat independent of the use of non-nitrogenous or fatty and starchy foods. We know that there are carnivorous animals who live entirely on flesh, and these require a large amount of exercise; as the muscles of the body are not consumed, they are obliged to keep in motion. Any of you who have ever seen the carnivorous animals in their dens at the zoological gardens must have observed that they are in a state of continual motion: this arises from the fact that they consume a large a quantity of nitrogen, which they can only get rid of by means of exercise. So that you have in all cases of motion a destruction of the muscles of the body, and the elements of nutrition are required to replace what is lost. It is quite clear that the life of an American Indian hunter is exceedingly well adapted to the food which he consumes. Such men will sometimes go for days together without food, and in that time they will of course have consumed a large quantity of the muscles of their body; but when they have caught their prey they will devour large portions of it, the flesh of which will be placed upon the muscles; so that in a very little while that flesh which was the flesh of a buffalo, or some other wild animal, would become the flesh of a man. Thus the pursuit of the hunter is well adapted to his food, and his food is equally well adapted to his pursuit. I recollect a case related by Sir William Alexander, which tends to illustrate this point. When he was travelling in Caffreland, at the Cape of Good Hope, one day a man came into the krail, who was almost starved; his body was quite emaciated with want, and it seemed as if he could hardly survive another day. Sir William had often heard that men in those parts, who had been a long time without food, would eat a sheep if it were given to them, without the slightest difficulty; and he was told that if he gave this man a sheep he would get well directly, although he seemed so near his end. After some little hesitation Sir William gave him one of the Cape sheep, which are not quite so large as our Leicesters; but which weigh, perhaps, as much as from thirty to forty pounds. The man commenced eating the animal, and did not cease until he had consumed about three-fourths of it. When Sir William saw him the next morning, he found him strong and well—so quickly had the muscular materials of the sheep been laid upon the muscles of the man. Many similar instances might be given of this apparently marvellous effect—apparently marvellous, I say, for it is not marvellous when considered in the proper light. In cases of this kind, we see proof that the animal economy has nothing to do but to dissolve the food which has already been prepared for it, and to place it in its proper position on the muscles, which are equally prepared to receive it. I may here remark that beans, peas, and lentils contain of all vegetables the greatest amount of flesh-producing principles. Having mentioned these two kinds of food—nitrogenous and non-nitrogenous—I may be allowed now to point out what we may learn by way of deduction from this—namely, that both rest and warmth are necessary for the animal's increase and proper development. First, let me notice warmth, which is so important that I need not apologize for introducing it a second time. As animals must consume a certain amount of the elements of respiration in their bodies in order to produce heat, and as they can only lay up fat in proportion to the amount of what remains after the necessary production of animal heat, it is quite clear that they should always be so sheltered as to be enabled to use the elements of respiration which are found in their food, so as to produce the best possible effect. It is also quite clear that if you take a pound of starch, or oil, or gum, or sugar, and burn it for the production of heat, you will produce far less heat than a pound of coal will produce for the same purpose. Therefore the time will come, I think, when coal will be used for the fattening of bullocks in the winter—when either by steam or by stoves the animal will be warmed, and left in such a state as to require far less food than he otherwise would for the production of animal heat. To me it is quite clear that any gentleman thus engaged in fattening animals would find it cheaper to purchase coals than to have consumed an equivalent amount of these materials. Again, rest is necessary for the animal. As every motion of the animal produces a corresponding destruction of the muscles which make that motion, it is quite clear that the more animals move about, the more of the element of nutrition will they require to supply what has been wasted. Everybody knows the difference between a long-legged Irish pig that gallops about like a race-horse, and one of Mr. Fisher Hobbs's little pigs, whose little legs would scarcely carry it through this room. The difference in fattening properties of course arises from the different quantity of exercise taken by the two animals. If you want your animals to be well fatted and fleshed, you ought not to allow them to have much motion; you ought to keep them for the most part still, and to let them have no more motion than is requisite for health. This is a case in which you gentlemen, with your practical experience, must be able to confirm me. I should be very sorry, indeed, if you allowed your animals no motion whatever, because I think that, considering the long period which it takes to fatten them, some degree of motion is indispensable to health; but depend upon it that in many cases, as, for instance, that of young calves destined for the butcher, the less motion the better. There is another point of considerable importance. We know that animals which are often asleep gain more flesh than others which are more wakeful. If you darken the place in which you keep your animals you will find them much more disposed to be drowsy, and consequently to fatten, than if they were exposed to the light. I shall now proceed to consider the necessity for adopting a distinct treatment for fattening and for growing stock. The modes of treatment to be pursued are quite different, and those who make no distinction will in the end find out their mistake; it cannot answer in practice. The young stock which you intend to grow must have a very different treatment from the stock which you intend to fatten for the market. You want the former to have a good constitution, and to increase their muscles and general size, and these can only be secured by giving them a considerable amount of exercise. Every one knows that the arm with which the blacksmith strikes the most gets strong by constant exercise. In like manner young stock should have exercise in the open air, take as much food as they can eat, of the proper kind, and then they will be found to fulfil the purpose for which they were designed. There is one great mistake committed with regard to young stock. It is supposed that before they have been weaned they can do with skim milk; in fact, that the materials which nature has provided them can be diminished in value without their experiencing any corresponding injury. There can be no greater mistake than this. The milk itself is well adapted for the purposes of nutrition. It contains caseine for the production of flesh, phosphate of lime for the production of bones, and sugar of milk and fatty matter for the production of heat;—thus giving everything a good food ought to give. But if you take away the butter and give the animal skim milk, you diminish that which nature has provided for the purpose of keeping up the animal heat, and the animal may get cold and be fevered. If you diminish, in fact, what nature has provided, you are sure to do injury. If you want to use the cream for butter you can add infusion of linseed, and when you are beginning to wean the animal, by an infusion of boiled beans which contain caseine, and of linseed which contains gum, you can, with a little treacle or sugar, make a powerful milk; for these substances contain all that the original milk contains. But every care ought to be taken in the rearing of young stock to give them the elements of nutrition, and you must not confine them to oily and starchy compounds, which will not serve the purpose. Even in the case of the human subject parents often fall into a very great error by feeding their children upon arrowroot and similar substances. They suppose that arrowroot contains some nutritive principle. In point of fact it contains none at all; it is merely starch, and consists of carbon, hydrogen, and oxygen. It may be very well for individuals who are unwell, and whose stomachs are in a very delicate state, to take the lightest kind of food; but for children, or for those who are growing, it is the worst kind of food that can be taken. On the other hand those kinds of food which contain the greatest proportion of nitrogen are the most useful for nutrition. There is a food recently brought out by Mr. Bullock, of Conduit-street, which consists of the flour of wheat kneaded with water until nearly all the starch has been got from it. This contains six times the amount of nutriment that is contained in ordinary flour, and it is one of the best kinds of food for delicate persons that has ever been devised. I repeat that young and growing stock ought to take exercise: it is absolutely necessary for them, in order that they may have a good constitution, and that the muscles, well developed by exercise in youth, may have the proper capacity for increase in age. I shall next refer to the cooking of food, and to the difference between barley and malt. On this subject I may observe that there is a great deal of misunderstanding as to what cooking can do. If nutritive and useful materials exist in a certain kind of food, cooking can only be useful by aiding their solubility. It can make them more soluble, and on that account a less amount of food probably will pass through the system undigested. I do not suppose that if we were to steam sawdust for a considerable length of time we should make it into a good food for animals. Those parts of the substance which are indissoluble, and which consist of woody matter, would still remain; but the other parts, such as starch or gum, or oil or fat, would be made soluble in water, and consequently could be more easily assimilated. The great point to be kept in view is that of getting the food more soluble, so as to be more easily acted upon in the animal. But there are also two sides to this question. It is very important to take care that these things are not carried too far. We know very well that the functions of digestion are very important; nor are they so simple as some are apt to suppose. There are more processes than one going on; and there are a great many things to be considered. If the requisite amount of saliva be not swallowed, it may cause a great defect, in an important element of health; and if animals swallow their food too quickly, probably they will not have sufficient saliva for digestion. It is necessary, I say, to avoid going to extremes in these matters. It is quite possible to prepare food so that it will be too easily swallowed. On this subject I would suggest to gentlemen who are engaged in farming to see whether my remarks are not borne out by their own experience. Now, with respect to the difference between barley and malt, there have been a great number of discussions on that subject. We have had the government giving certain results, which are corroborated, to a certain extent, by the experiments of Mr. Lawes. But I consider that, as yet, the question is not perfectly settled. I think it is necessary that some additional experiments should be made. As far as I understand the experiments of Mr. Lawes, the plan on which he proceeded was that of giving to animals continuously a certain quantity of malt; whereas in my judgment malt should be given, not continuously or exclusively, but as an occasional stimulant, and along with other food. There is a decided loss of vegetable matter in the process of malting or of germinating. It must never be forgotten that a quarter of barley does, in fact, contain more nutritive matter than an equivalent quantity of barley converted into malt, and it is possible that by merely steeping barley you would obtain all the good that you would secure by drying and making malt. I make these remarks because I think it very desirable that some other experiments should be performed for the purpose of clearing up the question, and deciding whether malt used in smaller quantities than by Mr. Lawes and Dr. Thompson used may not be a useful adjunct in the feeding of animals, and cause them to eat and fatten more than they otherwise would. Another point which I think it necessary to mention is the use of salt. The effect of salt, as taken into the system, is to enable the animal to form bile. Bile is a compound of a sort of carbonaceous resinous matter, with soda. Soda, as you all know, is formed from common salt. Without the presence of common salt in food no bile can be formed, and bile is necessary to the healthy action of the animal frame. But mind, any means which produces an excess of bile is merely robbing an animal of a portion of its food, and preventing the formation of a quantity of fat; because the bile is formed of fat, oil, gum, sugar, and so on, and really represents and embodies the carbonaceous materials destined for immediate consumption. The more bile you produce the less fat you produce; and the more salt you give to animals the more bile you allow them to produce. In these remarks I allude especially to fattening, not to growing stock. To the latter salt may often be an advantage. Therefore, though fattening animals may like salt, I think it injudicious to give them the free use of it. It is quite evident that in summer especially animals like salt very much; but if you want them to grow fat with the least expenditure of food, I think you ought to give them salt only in very small quantities. And then you are also to remember that all vegetables contain salt. A bullock will eat daily in its food 5 oz. of salt, which is contained in the ordinary saline materials of the food itself. If I were inclined to give animals salt at all, I think I should do so in the indirect mode of throwing it upon the land, and leaving the animals to take it up in their food. Another point which I wish to mention is the selection of stock. Of course I do not mean to dictate to practical men how they should choose their animals, but I may perhaps be permitted to remark that the animals which are likely to prove best for the market are those whose bones, liver, lungs, and intestines are the smallest. This leads us to the consideration of the constitution and fattening properties of different animals. We all know that when animals are fattening, and have gone on fattening for some time, they require a much smaller quantity of food than they did at the commencement of the process. Of course the more oxygen there is taken into the system by the lungs, the greater is the consumption of the elements of respiration, and the less the production of fat. Animals with small lungs, livers, and intestines, will consume the least amount of food, and have the greatest tendency to fatten. They will produce less bile—they will consume less ordinary food—cast by perspiration less out of the skin, and by expiration less from the lungs, and consequently would make a greater amount of fat with a less consumption of food. For the production of motion in animals you will have a destruction of the animal muscle exactly proportioned to the force produced. If you keep your animals perfectly quiet, the only flesh or muscle they will send out of their system will be that consumed to produce the involuntary motion of the lungs and the heart. Fattening animals thus kept will grow and arrive at that state of development which you desire, if you intend them for the market. Now what is the state of the case with regard to the horse? It is entirely different. In the case of the horse, you want animals with the largest lungs; because what is required in them is wind: you don't want them to fatten, but you want them to have large lungs, so as to be able to keep up their pace; and therefore in the treatment of horses you pursue a totally different system from that which you pursue with regard to fattening stock. And here I would observe that stock fattened in the manner I have described are evidently more delicate and more liable to disease than animals which have from infancy been exposed to the ordinary varying influence of climate. Therefore, it is an important question whether it be not possible that we carry our breeding too far, and cause loss from too delicate animals. Another point to which I would advert is ventilation, the want of which is, I believe, a fertile source of loss to many gentlemen who are engaged in farming. I have myself, in various parts of this country, been into stables and sheds which were not only unfit for any human being, but for any animal whatever, to live in. Animals have been obliged to breathe over and over again materials absolutely destructive to life. I have thought that a few experiments on this subject would more clearly show the necessity for attending to the point than anything which I could say, and these experiments I will now proceed to exhibit, in the hope that they will answer the design. The noxious gas given out of the lungs partakes of the character of the smoke which escapes from chimneys. We all know that if parties shut themselves up in a room and close the doors, and then burn pans of charcoal in that room, they will speedily die; they will, in fact, be killed by the fumes of charcoal which come out of the pan. In like manner we may be killed by the fumes of charcoal given out from the lungs; and when stables and other places are not sufficiently ventilated, this effect often takes place. The same noxious gas arises from all burning bodies which contain carbon. It is one of the properties of this gas to form a white precipitate with lime or baryta water. On holding this common ale glass over the flame of this candle, or burning paper, closing the mouth with the hand, pouring in a small quantity of lime water and shaking, a white precipitate will ensue [Experiment performed]. To illustrate more clearly and easily the properties of this gas, called by chemists carbonic-acid gas, I will procure some from common chalk, which is carbonate of lime. On adding a little common muriatic acid and water to the chalk in this jar, the stronger acid will liberate a large quantity of this gas, and we then can examine its properties [The gas prepared]. This gas is much heavier than the air, which it has no doubt completely driven out of this glass: this we shall know by inserting a lighted taper, which you see is immediately extinguished. On pouring a little of this gas into the lime-water in this glass, you perceive the same white precipitate as from the gas of burning bodies; and though you cannot see the gas because of its transparency, yet if I pour from this apparently-empty jar the contained gas over the flame of a candle, it will be put out [Experiment performed]. Whatever extinguishes flame would also extinguish animal life: the one effect is just as certain as the other. It is the gas thus produced which is called the after-gas, or choke-damp of the miner, and which destroys the lives of so many parties in pits, whenever an explosion takes place—in fact, the after gas produced from the burning of the charcoal of the coal gas destroys far more lives than the explosion itself. Those who were not killed by the one are destroyed by the other. I will now show you that the gas of my lungs will give precisely the same precipitate as this noxious gas from other sources. [The lecturer then breathed for about a minute through a glass tube into a glass of lime water, when a white precipitate became distinctly visible.] By referring to the diagrams (pointing to some diagrams hung against the wall) you will observe that the quantity of this poisonous carbonic acid given out daily by man is 27 cubic feet, by the horse 190 cubic feet, and by the cow 137 cubic feet; these numbers represent the amount of charcoal united with oxygen in the animal system to produce the necessary animal heat. Now I would observe that there is a double deterioration going on if any limited or insufficient quantity of air is breathed by a number of animals. First, the oxygen, without whose presence we cannot live, is absorbed; secondly, it is replaced by carbonic acid, which is a deadly poison. To what an extent, then, may the air be deteriorated by inattention to this subject! We would here refer to what God has done in nature, as it tends to show the importance of the whole question. God has so diluted this substance, that 10,000 feet of common air contain only two feet of carbonic acid. It has been ascertained that 5 per cent. of it in the air acts as a poison to animals. Therefore, in order to know how much air would be vitiated in one day by a horse, you have only to multiply 190 cubic feet by 20, and the product will be 3,800 cubic feet of air, which would be rendered perfectly poisonous by one horse in twenty-four hours, and half of that, 1,900, in the course of twelve hours. Now it is quite easy to understand how poisonous may be the air of stables. Air with four per cent., three per cent., two per cent., one per cent. of carbonic acid will have poisonous properties to a greater or lesser degree. With reference to economy, and to the state of your balance-sheets at the end of the year, nothing can be more important than this subject of ventilation. Without this you may give animals the best kind of food, and it may all be turned to poison: you will be only throwing away your money. Now, as I said before, all that it is in my power to do is to bring before you some of the principles; leaving you to test them by practice. There are so many important points embraced in the subject that it was impossible for me to notice all; but I have no doubt sufficient have been introduced to elicit discussion. There is one other point which I must notice before I conclude, namely, the necessity of mixing different kinds of food together with a view to assisting proper and healthy digestion. You should take care to have a proper mixture of nitrogenous and of non-nitrogenous food. The carnivorous animals, as you well know, live upon flesh alone; and between them and herbivorous animals there is a very great difference as regards the change to be made in food. The proper mixture can, in fact, only be determined by experience, but great care should be taken not to give too much either of the one or the other kind of food. It is quite possible to injure an animal by the amount of one particular kind of food which you give to it. It is a question to what extent oilcake should be used in fattening animals. I believe that in a great number of cases it is given to too large an extent. Parties sometimes give animals large quantities of this food under the supposition that if it does not benefit the animal itself, yet by passing through him it will secure benefit in the shape of manure. All I will say on that subject is, that a ton of guano is equal, in manuring powers, to two tons and a half of oilcake, and that therefore unless this benefit the farmer by being converted into beef or mutton, it will be a most expensive system of manuring. When you know that there is such a thing as food passing through the animal system without being digested; when you know that starch granules may pass through the system without being acted upon by the stomach, you cannot but feel that if you give animals more oilcake than is adapted to them, that oilcake may pass through the body without being acted upon, and your loss may be in proportion. I wrote to my friend Mr. Mechi to get his assistance to make a few experiments on this subject for illustrating my lecture this evening. I wrote to him to assist me; but I am sorry to say I have been disappointed in him, and the experiments have yet to be made. The question which I wished to have solved is this: How much oilcake can a good fattening bullock eat per day, so that none passes through the system unacted upon? I wished a bullock to be fed three days with, say three pounds of cake per day. At the end of the third day I would bottle up a sample of its dung for analysis. The next three days the animal should have six pounds per day, and then nine pounds, and so on. The various samples of dung should then be analyzed; the quantity of oil and the amount of nitrogen carefully determined, and thus we should have the means of knowing how much went through the animal untouched and unacted upon. If any gentleman will as a farmer undertake the practical part of the experiment, I as a chemist will engage to work out the scientific results.


[Candle extinguished by a stream of carbonic acid gas.]

Mr. Mechi: I will undertake what you require (cheers).

Mr. Nesbit: Gentlemen, I will not trespass further upon your attention. I would only say, in conclusion, that I think you ought not as agriculturists to speak against science. (Hear, hear.) True science never puts itself out of its place, and I think true practice should never do so either. What we want is a union of the two. It would be better if practice and science were united in the same person; but so long as that is not the case, and so long as the rising generation are too young to apply what they are learning, we must look to a union of scientific men with practical men. The really scientific man who knows the requirements of farming will never for a moment conceive that he can supersede the practical experience of ages by any theories of his own; and on the other hand, the practical man should not be too ready to condemn the scientific man, because he (the scientific man) cannot explain every circumstance and every fact in nature. I am much obliged to you, gentlemen, for the kind attention which you have paid to my remarks (cheers).

Mr. MECHI said he was in a position to illustrate the ill effects of breathing carbonic acid, from what occurred the other day on his own farm. A couple of calves were placed in a building the ventilation of which had been destroyed by the erection of another building close to it, so as to cover up the holes. The weather being cold, one of his men shut the door. The result was that one calf—the smallest—was found dead, and the other nearly so. The one not dead was placed in the air, and recovered in a few hours.

Mr. SHAW said that, at the risk of committing himself, but with the view to promote discussion, he would offer a few remarks upon the subject under consideration. A friend of his who, as member of a Farmer's Club, was anxious to induce the members to speak, adopted the course of advancing an opinion so diametrically opposed to their daily practice that he roused in them a spirit to rise and contradict him. Such might be the result of the observations he should make in reference to the very excellent lecture which his friend, Mr. Nesbit, had just addressed to them (cheers). He had always been prepared to admit to a very great extent the importance of science in connection with agriculture. He was quite sure that all would admit that the scientific principles which Mr. Nesbit had elucidated that evening came home, on many important points, to their own practice. At the same time, it was impossible not to feel that there was a good deal of complication and difficulty in the subject (Hear, hear); and that an unscientific man could not easily obtain the necessary degree of acquaintance with science to practice upon it on his farm. Hence, he would remark, how extremely absurd it was for persons to recommend farmers as a body at once to jump as it were out of the knowledge which they had derived from their ordinary practice, and to adopt that science which Mr. Nesbit possessed. It was perfectly true that farmers might improve themselves, and, as Mr. Nesbit observed, perhaps the next generation of farmers, having been early instructed in these matters, might find that knowledge exceedingly useful, and become better farmers than the present race; but it was not to be expected that the great mass of those who were engaged in such a business as that of farming should at once become possessed of a full knowledge of science, and thence be enabled to avail themselves of all those advantages which perhaps in another generation science might afford to agriculture (Hear, hear). He would advert to one or two of the points which Mr. Nesbit had brought under their notice. In the first place he would refer to the temperature in which animals should be kept. When Mr. Nesbit was speaking on that subject, his (Mr. Shaw's) mind ran rapidly over what he had himself seen when resident in the country with respect to the mode in which animals were generally kept, and he could not help reflecting—with the aid of the little practical knowledge which he possessed in reference to the advantages derived by the animal from warmth—what an immense amount of loss there must have been for want of attention to that point. When he resided in the West of England it was the constant practice to keep the dairy cows during the whole of the winter in the fields, where they had their hay given to them under a hedge, and turned their backs to the wind having no other shelter. It was true that some improvements had since taken place, the result of experience and observation, but still he had no doubt that a great number of practical farmers might derive much advantage from turning their attention to the question of affording shelter and warmth to their animals generally (Hear, hear). Another important point to which Mr. Nesbit alluded was the advantage, nay, the necessity, of enabling young stock to have exercise. He would be very glad if some gentleman would inform them what was the result of his experience on that point. Mr. Nesbit had told them that a certain amount of exercise was necessary to secure a good constitution and growth to a young animal. He would be glad if some one would state from experience whether any evils had arisen from keeping young animals always in a box, and not allowing them to leave it until they were fit for the shambles. There was a system of that kind recommended now; and it would, he thought, be advantageous if it were stated whether practice was found to accord with or contradict the principle laid down—a principle which appeared to him right and sound, because in accordance with nature herself (Hear, hear). With respect to the question of the comparative feeding qualities of barley and malt he must confess that from all the information which he had been able to collect—and he had endeavoured to collect as much as possible—it appeared that the unrestricted use of malt would be very valuable to the farmer. He saw there a gentleman who had made some valuable experiments on the subject, than whom no person was better qualified to give an opinion; he referred to his friend, Mr. Hudson, of Castle Acre (Hear, hear). No person, he believed, had taken more pains to work out the experiment on the effect produced by malt in the feeding of animals, as well as that of the steeping of barley for the same purpose. A friend of his told him on Monday evening that his practice was to steep barley, and sprout it, for the use of his horses; and that he found it an excellent food for horses; he did not state whether he found it equal to malt. The use of sprouted barley appeared to have a bearing on Mr. Nesbit's observation, that in the manufacture of malt some portion of the nutritive matter of the barley was lost. Another observation made by Mr. Nesbit with respect to the disposition of the lungs to decrease in size in proportion as the animal became what was termed a better-feeding animal or more capable of laying on fat, and of serving the purpose of meat, appeared to him most important. If breeders confirmed Mr. Nesbit in the opinion that the lungs of the animal got less in proportion as it was treated artificially, and if in consequence the animal became more susceptible to disease, it appeared to him to be a very serious question for breeders whether that system might not have some connexion with the disease of the lungs which had prevailed amongst animals for some years past (Hear, hear). It was well known that a very fatal disease existed in many parts of the country, and it was a most serious question whether that was a mere epidemic, or whether the constitution of animals had undergone a change, in consequence of their having been treated too artificially (Hear, hear). With respect to ventilation he would only observe that the experiments which they had witnessed were so clear and decisive that they could not have failed to bring home to the minds of all present a conviction of the importance of paying more attention to that subject (Hear, hear). It was a most extraordinary fact, that of all the subjects of the day, whether in reference to the ventilation of stables or of the Houses of Parliament, this question seemed to be involved in the greatest amount of obscurity; no one seemed to know how to conquer the difficulty or to insure a good system of ventilation. As he said at the outset, his object in rising was simply to throw out some remarks which might promote discussion, and he hoped the effort would not have been in vain.

Mr. MECHI said: Having been so pointedly alluded to by Mr. Shaw, he hoped he should be allowed to offer a word of explanation with regard to the rearing of calves in covered places. He had reason to believe that that system could be advantageously resorted to for the fattening of animals. He did not say that it could in the case of animals intended to propagate their species; although he had seen young bulls, at Woburn and other places, thus confined up to the period of their full growth.

Mr. W. BENNETT: And generally damaged by it (Hear, hear).

Mr. MECHI continued: A very careful and respectable farmer in Suffolk had assured him that animals which he had taken as calves from the mother, and fed in the manner which he had mentioned, sold at two years old for £5 more than others which had had the best pasturage. He himself found no difficulty under that system in getting animals to weigh 40 scores, or 800lbs., at two years old. He had fifty calves then on the boards. He would be happy to show them to any gentleman present; and perhaps when Mr. Shaw had seen them, he would make amends for his remarks that evening (laughter). A gentleman who pursued this system had observed to him, that in the case of animals that were so closely and well fed, he found it necessary to watch their health; and if there was any loss of appetite he gave a dose of physic as a substitute for exercise. That gentleman was extremely successful in the rearing of animals.

Mr. HUDSON said he had not much to say on that occasion. He was almost inclined to get out of the business of fattening animals altogether—("Hear, hear," and cheers); so nearly had the loss of 1s. per bushel on wheat, and 1d. per lb. on meat, swept away the farmer's profit (Hear, hear). As regarded the feeding of cattle on malt, his own experiments were made some time ago; and he had hoped that other farmers would take up the matter, and give the public the benefit of their discoveries. The three little bullocks which he was exhibiting this year in the Show-yard had afforded some proof of the advantage of using malt. In consequence of their having got very dainty, a little malt was given to them; and they took to it very well. They ate about half a peck a day; whereas they would not consume half that quantity of oats, barley, or beanmeal. He believed Mr. Nesbit was perfectly right in saying that all animals required a variety of food; and he believed that in fact it was scarcely possible to vary their food too much. He also agreed with that gentleman as to the necessity for keeping them warm; but he must observe, that if young cattle were to grow up healthily they must have a chance of enjoying air as well as exercise (Hear, hear). The ventilation of sheds and stables was a most important question. He did not know how they could ventilate better than by having an adequate number of cupolas on the roofs and slides in the doors, so as to provide for the circulation of the air through the building. Something had been dropped with regard to the advantages of animals being kept rather in the dark. He believed it was an excellent plan. In the summer time especially it was well to have places dark, and so situated as to keep flies out, which he need scarcely say teased the animal and prevented it from thriving. He would not pretend to follow Mr. Nesbit in his very scientific discussion that evening; but as far as practice went he fully agreed with him, that the greater the variety of food, both vegetable food, and meal and cake, the better would it be for the animal. With regard to Mr. Shaw's observations on the subject of malt, he felt perfectly satisfied that whatever scientific men might say, malt was, in fact, one of the most fattening things that could be employed (Hear, hear). Unfortunately at the present time he (Mr. Hudson) had a very inferior description of barley: out of 300 acres scarcely one was fit for malting. Of course, therefore, it would be a great advantage to him to be relieved of the duty.

Mr. W. BENNETT wished to make a remark in allusion to the observation of Mr. Nesbit, that the lungs of animals became smaller in proportion as the animals themselves became fatter. With regard to the Leicester breed of sheep, it was some years ago considered by the breeders a great point that the body of the animal should not hang lower than the breast. It was not considered well that the animal should have a remarkably large paunch. No one liked the appearance of an old Down sheep that carried a pair of panniers—(laughter)—but there was a great danger of running into the opposite extreme; and he was quite sure that that had in fact been done. The course pursued had in many instances, especially in the case of Leicester sheep, produced a delicacy of constitution in the animal which was so mischievous that occasionally it altogether destroyed the constitution. He had seen that illustrated by the experience of persons who had bred long in that department. It was, therefore, desirable to have a fair proportion of stomach to contain the food, and by that means to attain the requisites for the proper development of the animal. He was quite satisfied that of the two evils it was worse to have an animal too small in the stomach than to have it too large, because by the latter means you destroy the animal's health (Hear, hear). He found that authorities differ with regard to the malt question, which was at present one of vital importance to them (Hear, hear). Had there been anything like a common effort in the farming community that odious tax would ere now have been got rid of (cheers). The misfortune was that farmers disagreed among themselves with regard to it, and it was quite clear that so long as that difference continued the government would not be disposed to give up that source of revenue (Hear, hear.) To him it was a great mortification to find that farmers disagreed first with regard to the utility of malt in the feeding of animals, and secondly with respect to the importance of getting so heavy a burden upon farmers removed (Hear, hear). He believed that the only reason why the use of malt had ever been treated lightly was that the use of it had not been judicious (Hear, hear). Of this he was persuaded by his own experience some years ago when he lived in Norfolk. At that period he had a very clever man to attend to his horses. On one occasion he wished to have two or three fatted for sale at a fair in the district. A long time before the fair he observed to his man that he thought it desirable that some young horses which were designed for the fair should be fed upon a better kind of food. "Oh," he replied, "you do not want to begin yet: if you will let me have a little malt shortly before the fair, I will undertake to get them fat." About a fortnight before the fair he commenced feeding them with malt, beginning with a pottle, and increasing the quantity to half a peck. What was the result? He (Mr. Bennett) never in his life saw animals turned out in more beautiful trim, whether as regarded the health, the skin, or the general appearance. Therefore he thought that whenever malt had been brought into disrepute as food for animals it must be through the injudicious use of it. He did not indeed believe that malt was a kind of food which could be given exclusively with advantage to any animal; but in small proportions to sweeten other food, he believed its benefit was incalculable (Hear, hear). He would not dwell on the subject any further. As a plain practical man he liked occasionally to throw out a hint, but he hoped he knew better than to treat with unfairness gentlemen who devoted so much time and talent to the subject as had Mr. Nesbit, and he would add Mr. Mechi. He would conclude by expressing a hope that they would yet have from some of their friends interested in the subject some further experiments with regard to the use of malt (Hear, hear).

Mr. PAWLETT said: My experience in the feeding of cattle and sheep quite agreed with the theory, in almost every detail, so ably laid down by Mr. Nesbit. I am induced to make a few observations on an experiment I tried in 1849 with four lots of Leicester lamb hogs. Each lot had as many swedes and mangold wurtzel as they would eat; and, in addition, one lot had half a pint of linseed each sheep per day; another lot half a pint of maple peas each; another lot half a pound of oil-cake each sheep; and the remaining lot had three-quarters of a pint of malt each sheep per day. This experiment was begun in January, when the sheep were all weighed alive, and again at the end of six weeks. Those lamb hogs which had the linseed given them, gained on the average 19lbs. each; those that had peas, 17¾lb.; the lot that had oil-cake given to them, 16¾lbs.; and the remaining lot, which had the malt, 12lbs. each. Another pen of my best ram lamb hogs, which I was preparing to show for a premium, were fed with a variety of kinds of food, and also had a little malt given to them every day for a few weeks, and I found, in weighing them alive, that they did not thrive so much as others which had no malt. I should not, particularly at this time, as it might tend to cause disunion between us, have given the result of my experience of feeding sheep with malt, had I not been called upon to do so, although I am pleased to find that it agrees with the principle advanced by Mr. Nesbit. I also quite coincide with his observations that a variety or compound of food is essential in feeding animals; for instance, Swede turnips and mangel wurzel, mixed with corn or clover chaff, will feed sheep much faster than swedes and corn only, which I have proved by three experiments to my own satisfaction, by at least 25 per cent. A similar result I have found from the average of three experiments, that sheep will gain much more weight if they have clover hay chaff with swedes, than if fed on swedes only. It is gratifying to find science agree with practice, and I feel much pleased with the statements made this evening by the gentleman who has so ably introduced this subject to our notice.

Mr. WILLIAMS would be glad to know whether the sheep fed upon malt ever rejected the food given to them?

Mr. PAWLETT: No, not at all.

Mr. WILLIAMS: Did they eat it with avidity?

Mr. PAWLETT: They ate all that was given to them.

Mr. SHAW craved permission to make one observation on what had fallen from Mr. Pawlett. He thought the statement of that gentleman with respect to malt ought not to go forth as a naked statement, and without comment. The remark which he would make upon it was this—that the experiment was a valuable one, and that it was entirely corroborative of the principle which had been laid down by Mr. Nesbit; that it did not tend to disprove the value of malt when properly used, but showed that feeding with malt alone produced the effect which Mr. Nesbit had stated (Hear, hear).

Mr. R. SMITH said, when Mr. Pawlett stated, in reply to a question from the other end of the room, that the animals did not reject malt, it struck him that if the same amount had been expended on malt as on other things, it was quite possible that it would have come up in value. It would be in the recollection of all that a statement had appeared in the *Mark Lane Express* with regard to an experiment which was tried by Mr. Hudson upon a Scotch ox. The same experiment was tried by Government on two milch cows; but what in the world had that to do with testing the feeding qualities of malt? (Hear, hear). He confessed he was at the time not only disappointed but disgusted with the trying of such an experiment in high quarters (Hear, hear). Some of the gentlemen present might remember a white ox which he (Mr. Smith) exhibited in 1844. About two months before the time for the exhibition that beast came to a stand-still. It occurred to him to try malt. Malt came to his rescue, and it ended in his taking the first prize. (Hear, hear.) It might also be familiar to some present that he was in the habit of breeding a number of sheep, males in particular. Some years ago he advertised in different newspapers that his annual exhibition would take place on the 3rd of September. As it turned out, the exhibition could not take place on that day. The animals got amiss, and he was obliged to postpone the show for a fortnight. He then bethought himself what means he should take to bring them round in time. By giving them a little malt he got them on their legs in time; and so great was the improvement, that his friends said it was the best show he had ever had. Had it not been for the use of malt he must have lost several hundred pounds. (Hear, hear.) As regarded what had fallen from Mr. Nesbit, he thought it exceedingly valuable, and he felt exceedingly delighted that that gentleman's scientific pursuits fell in so far with practical results. It would be remembered that some time ago an essay was published in the *Journal* of the Royal Agricultural Society on the management of sheep. Of that essay he happened to be the writer. (Hear, hear.) It contained an account of twenty experiments on the use of various vegetables, grain, oilcake, and so on. What was the result? On turning to the essay they would find that it exactly accorded with the scientific observations of Mr. Nesbit.

Mr. MECHI: Can you form any opinion, from your practice, as to the effect of shutting up young animals?

Mr. SMITH said he made experiments as to the effect of feeding in different situations, whether in the open fields or elsewhere, with various degrees of warmth. He found that the season had a great deal to do with the result. (Hear, hear.) It was nothing else than a question of wamth. (Hear, hear.) He discovered, in fact, there was one great principle to be attended to, and that warmth was an equivalent to food. He had tried these experiments for his own information, and he must say they had, to a great extent, come to his rescue. As regarded ventilation, he would observe that he put six sheep into a close shed, which was not ventilated. Not having the scientific knowledge of his friend Mr. Nesbit, he did not know what would be the result. The next morning one of them was dead, one nearly dead, and the four others in a very uneasy state. Common sense told him what course to pursue with regard to the sheep which was so nearly killed, and the result was that it recovered. There appeared to be great force in the remark that young animals required exercise to promote their growth; but he could not help there mentioning an important fact bearing on that point; namely, that when he was one of the stewards of the Smithfield Club show, one of the best animals exhibited was a heifer of Lord Radnor's, which his lordship's agent, Mr. Moore, assured him had never left the shed. (Hear, hear.)

Mr. COOK, of Seymer, said his animals were kept in a sort of covered yard, where they throve very well indeed.

He was happy to be able to confirm generally what had fallen from Mr. Nesbit.

Mr. WILLIAMS said he concurred with Mr. Nesbit and Mr. Bennett, that in attempting to fatten animals there was a great danger of producing too slight a constitution. (Hear, hear.) He did not mean to say that the constitution would be too slight in all parts of the country. But on the Wiltshire Downs, where he lived, there were animals which, in the course of two or three generations, often became so slight, that the loss in point of constitution was awful. (Hear, hear.) Many persons had sustained a loss of two or three hundred lambs in the last year. It was a practical consideration whether with such results before them they ought to proceed any further in the same direction. As Mr. Hudson had spoken of sprouting barley for his horses, he would be glad to hear whether the practice was permitted by the government. This question was a very important one, for it could not be doubted that the use of barley would add very much to the nutriment of the mother's milk.

Mr. HUDSON was happy to say that he had the highest authority for the practice. He happened to be one of a deputation that waited on the late Sir Robert Peel, some years ago, when he was prime minister, for the purpose of obtaining a boon for the agricultural interest. On that occasion he (Mr. Hudson) urged the necessity for the government allowing a drawback upon the duty when an inferior description of barley was made into malt, for the fattening of animals. Sir Robert observed, in reply, "You have always had the privilege of sprouting your barley, and why not do it now?" He did not know how they could have higher authority than that of the prime minister, given in the presence of thirty or forty other persons besides himself (Hear, hear).

Mr. MECHI inquired how long it took to sprout barley?

Mr. HUDSON said that depended partly upon the weather. If the weather were mild, four days would ordinarily be sufficient; if cold, five days; if extremely cold, six days might be required.

Mr. SHAW: With respect to permission to sprout barley, I would observe that there was a formal minute of the Excise passed some years ago giving that permission. He knew the fact from having been to the Excise office, and obtained a copy of the minute for parties who had applied to him for it (Hear, hear).

The CHAIRMAN said he would not detain them many minutes; but there was one observation of Mr. Nesbit's which he could not pass by, because it perfectly accorded with his own practice. About three years since he built some new piggeries in an open yard, and when he first put his pigs in it he felt astonished that they grew so slowly. It so happened that, as there was not sufficient room for all his pigs, four or five were put into an old-fashioned stye, which was dark. In six weeks the pigs which were put in the dark made twice as much meat as those which were in the light made in the same period; and so convinced was he that he had done wrong, that he took the earliest opportunity of placing the others in a similar position. There was no plan so good as that of feeding pigs in the dark, at the same time that provision was made for ventilation.

Mr. MECHI was happy to confirm the Chairman's view. He had himself 200 pigs, which were all in the dark.

Mr. NESBIT then replied. He was very glad that Mr. Shaw had taken up the point of the decrease in the size of the lungs, and the consequent possible deterioration of the constitution of the animal. It was clear that an altered constitution must require an altered artificial arrangement. Several gentlemen had mentioned the fact of sheep having deteriorated so as not to be able to sustain the ordinary atmospheric influences. It was, of course, of great importance that the system should not be carried too far, and that they should look to the health of the animal, as well as its propensity to fatten. With regard to the keeping of young stock without exercise, or with a very small amount of exercise, it did not follow, from what Mr. Mechi had said, that young animals were to be exposed to cold and wind. The purpose to which stock was intended to be applied should always be kept in view in the method of treating it; and as regarded the increase which was said to take place in animals which were kept closely shut up, he would remark that it might be an increase of fat, and not of flesh. With respect to malt, he must observe that it was a very great error in the government experiments that it was used in such quantities, and without being mixed with other food. It was unfair to try the experiment of keeping animals on one specific food. He would say, in conclusion, that it behoved every one who had the good of his country at heart, to do everything that he possibly could to increase its productive powers. He was convinced that scientific men felt exceedingly anxious to do their part; but it ought always to be borne in mind that they required encouragement, and not taunting. (Hear, hear). He would be very sorry to tell them that that could be grown at a profit which, in reality, could not; but the question of profit was a practical one, and science must not be expected to decide it. It would be an immense benefit to agriculture if science and practice were combined; and he hoped to live to see the time when the rising generation would receive a good education in chemistry, botany, and geology, and when subsequently as farmers they would understand the nature of the different substances with which they had to deal. It was quite a mistake to suppose that science could not be acquired; it could be acquired just as much as reading, writing, or anything else; it might be got during the process of ordinary education; and were it generally possessed it would, in some degree, enable farmers to cope with their present difficulties.

Mr. SHAW said he had never risen with greater gratification than he did then, to submit a resolution at the close of one of their meetings. The subject had been treated by Mr. Nesbit in a most satisfactory manner, and so as to avoid all opposition. He had great pleasure, then, in proposing the following resolution—"That the scientific principles laid down by Mr. Nesbit in his valuable and interesting lecture, so far as they can be tested by the experience of this meeting, are consistent with practice."

Mr. BENNETT seconded the resolution, which was adopted unanimously.

A vote of thanks was given to the Chairman (who that evening terminated his year of office), and briefly acknowledged; also to Mr. Nesbit for his lecture; and this terminated the proceedings.

THE LONDON FARMERS' CLUB DINNER.

The annual dinner of the club took place at Radley's Hotel, Bridge-street, Blackfriars, on Thursday evening, Dec. 12. The chair was taken by Mr. W. F. Hobbs. There were present, Mr. Pusey, M.P., Mr. Cobbold, M.P., Mr. Emery, Mr. Hudson (of Castle-acre), Mr. Robert Smith, Mr. W. Shaw (of Northampton), Mr. Owen Wallis, Mr. T. Knight, Mr. Jonas Webb, Mr. Mechi, Mr. Shaw, Mr. Cuthbert Johnson, Mr. J. C. Nesbit, and many other of the most active members of the club.

After the cloth had been drawn,

The Chairman said that in the capacity which he had the honour to fill, it was his intention to permit a greater deviation than ordinary from the topics ordinarily discussed by the Club. He hoped they would all place themselves in his hands, assuring them that he would allow them to go as far as was consistent with his duty as chairman. He felt convinced that any opinions which they must express would be worthy of them as prominent members of the yeomanry of England, as well as of that club. (Cheers).

After a short interval,

The Chairman again rose. He said the toast he was about to propose was one which always met with a cordial response from English tenant-farmers; and he was sure that at a period when the Queen's supremacy was questioned, the yeomanry of England would stand forward to defend the altar and the throne (cheers), and to shield her Majesty against attacks from whatever quarter they might proceed. God grant that she might have a long and properous reign, and that in swaying the sceptre of this realm she might always remember the importance of the agricultural interest. (Cheers).

The toast was drunk with loyal enthusiasm.

The Chairman then proposed "The health of Prince Albert, and the rest of the Royal Family." The Prince had, he observed, always manifested his interest in the pursuits of agriculture; he trusted that he would do so still more, and become acquainted with the true position of the tenant farmers of England (Hear, hear).

This toast having been duly responded to,

The Chairman gave "The Army and Navy," and in so doing observed that many members of both professions had been deeply attached to agricultural pursuits, and, after attaining the most eminent rank, had, like the Roman of old, returned to their homesteads and converted the sword into the ploughshare (cheers).

The toast was well received.

Mr. Pusey, M.P., at the call of the chair, rose to propose the principal toast of the evening, namely, "Success to the Club." The hon. gentleman said that, before proposing the toast, he felt bound to return his best thanks for the honour—for an honour he considered it—which the committee had done him in inviting him to that dinner. In accepting the invitation he felt that, though not a member of the club, he should not be a stranger among them (cheers). During the period of his connection with the Royal Agricultural Society—in which he had fulfilled the highly responsible duty of conducting the "Journal"—he had felt, from first to last, that in the conduct of that "Journal" the society must mainly depend on the experience of the English farmer (Hear, hear). When he began he was of course comparatively ignorant—he might indeed say altogether ignorant; but he at once set about collecting the practical knowledge of farmers (Hear, hear). Now that he did know something of the subject, he felt that the course which he took was the right one: and he also felt most deeply interested in the prosperity of the English farmer (cheers). That brought him to a matter which he last year ventured to refer to the members of that club. They had heard for a great many years, and many gentlemen believed in, the great superiority of Scotch farming to English farming. He believed in it once; but he knew a little more about the matter now (laughter). Having heard so much about it he wished to bring it to a test. Some time ago, therefore, he begged the committee of that club to offer on his part a bet of £150 to back three farms in the eastern counties of England against three farms in all Scotland. There were to be three events; and he left it to the club to settle the conditions. This was communicated by the Farmers' Club to the Haddington Farmers' Club; but he was not aware that the challenge had been accepted up to that day (cheers and laughter). There had, in fact, been no answer. Now he should not say one word against Scotch farmers if they only praised each other; they would be perfectly welcome to do that; but when they depreciated English farming his blood was up (laughter). He felt that, as being connected with an English journal, the character of English farmers was in some degree in his hands; and as long as he continued connected with it, he would not listen to that depreciation in silence. Well, the challenge had, as he had stated, been given, and was not accepted. Yet he read in a newspaper, which should be nameless, that a gentleman from the East Lothians who had been travelling in Norfolk, had remarked upon the superiority of Scotch farming to Norfolk farming. Why? Because, while in the East Lothians land sold for forty years' purchase, in Norfolk it would sell for only thirty. He (Mr. Pusey) would draw the opposite inference. His conclusion would be that the land of Norfolk had been improved so much already, that it could not be improved much more; whereas the land in the East Lothians having been in a very bad state one hundred years ago, had been so much improved, that its value had of late greatly increased. He had travelled in Scotland himself, with a determination to look into the matter, and drove his own horses through twenty or thirty miles a day. He saw along the sea-coast some wonderfully fine deep red land, very well farmed; but having horses with him he left the sea-side and rode up to the hills. There he first found very indifferent farming, then bad farming, and on the tops of the hills no farming at all (laughter). On this subject, as he did not wish them to rely upon his opinion, he would read to them that of an old farmer who afterwards turned politician—the opinion of Oliver Cromwell, who began life as a farmer and grazier at Huntingdon. On the 25th of September, 1650, he wrote thus to the Lord President of the Council: "I thought I should have found in Scotland a conscientious people and a barren country. About Edinburgh it is as fertile for corn as any part of England:" and such was his (Mr. Pusey's) opinion of the land. About one hundred years afterwards, Dr. Johnson, who wrote a great dictionary, and was half blind, and living in Bolt-court, Fleet-street, of course did not know anything about land, wrote from Edinburgh that he never saw finer land in his life. It must have been very good to have struck him. His lamented friend, the late Lord Leicester, said the Scotch must be very much afraid of their wheat, as they allowed so many docks to grow up to support it (laughter). When in Scotland, he (Mr. Pusey) saw a great deal of land that was entirely out of cultivation. He would not pursue the subject. If the Scotch would let them alone they would let the Scotch alone; but so long as the Scotch went on boasting of the superiority of Scotch farming, he would declare his belief that that superiority was as gross a humbug as was ever palmed by the vanity of one nation upon the credulity of another (cheers). The challenge which he had mentioned was still open, and he would be most happy to make the wager, in defence of British farmers. While he thus individually expressed his opinion on the comparative merits of English farming, he must add that it was by no means free from defects (Hear, hear). He did not at all mean to flatter English farmers (Hear, hear). He did not intend to imply that they could not possibly cultivate better; but having a high opinion of English farmers, and being persuaded that one of the most effectual methods of promoting their interests was to bring them together in a club in which they could talk over their mutual interests, it was with the greatest cordiality that he proposed "Long success and prosperity to the London Farmers' Club."

The toast having been cordially drunk,

Mr. W. Shaw, of the Strand, returned thanks. He said the duty of responding to this toast had now devolved upon him several years in succession, and he must confess that upon no previous occasion had he risen with such mixed feelings of gratification and its opposite as on the present one. He experienced great gratification, because the club had not been affected by that severe distress which was now overwhelming farmers as a body. He was glad to be able to announce to such as did not frequently attend the meetings, and who consequently did not know much about the state of the club, that that distress had produced no effect on the condition of the club, and that although they did not increase so rapidly as they could desire, still, on the other hand, they did not retrograde, but, on the contrary, made some little advance. He experienced great gratification also in being able to greet their friend Mr. Pusey as a visitor (cheers). He called that gentleman most honestly and sincerely their friend, not only on account of his devotion to scientific agriculture, but because he pursued that course which every man should pursue who wished to obtain a correct knowledge of the real position of agriculture; namely, that of seeking information from practical agriculturists. That club was very much indebted to Mr. Pusey for the readiness with which he had on all occasions taken up any matter in which he could render them assistance (cheers). He co-operated with them, when they sought his aid, by promoting that valuable measure which he trusted was not far from its consummation—he meant the measure for providing security to the capital of the tenant farmer through the principle of tenant-right. (cheers.) That question had not indeed been much agitated of late, because there had been other and more overwhelming questions which had absorbed their thoughts; but he felt perfectly persuaded that, sooner or later, the same protection as was afforded to capitalists in other classes of society in this country, would be honestly and fairly extended to farmers. (cheers.) Again, he thought they were indebted to Mr. Pusey for the noble manner in which he came forward to rebut the attack upon the character of English farmers, and to which he had so *naively* and so pointedly adverted that evening. Every effort was made by the committee of management to induce the Haddington Club, with which they were in correspondence, to take up the challenge which Mr. Pusey offered; but he was sorry to say that the subject was suffered to drop, and that to the two or three last letters which the Secretary wrote they could not even elicit an answer. At all events, a challenge had, through Mr. Pusey, been given to the northerns; and he did hope that some of them would yet have the spirit and the courage to accept it. This he hoped not merely because he did not doubt what would be the result, but because he believed that such a contest, undertaken in a friendly spirit, would be beneficial to our national agriculture (Hear, hear). Their chairman had intimated that he would permit them to deviate a little in their remarks, just as far as he chose that they should go (laughter), from the right line; and although he (Mr. Shaw) would be very sorry to introduce any topic which might create a schism in the club, still he thought the position in which they then stood was of such importance that he might venture at least to offer a few remarks on the subject; and indeed the club could scarcely be called a farmers' club if they were compelled wholly to avoid such a topic (Hear, hear). There was, even in a society of that kind, a material distinction to be observed between questions which might be called purely political, and other questions in which the interests of farmers were especially involved; and he thought it it was not absolutely necessary that they should take either one side or the other in absolute party politics, in considering the position of the tenant-farmer. He knew that much was expected of that club, and he believed that up to that time it had done some little of what was expected from it. He would not occupy their time by referring to the various subjects which had been discussed in the club from the commencement; and although, perhaps, at that moment there might be many who regarded those subjects as dry in comparison with the great subject which now occupied their minds, yet he felt persuaded—nay, he had ample evidence—that through the instrumentality of that club, subjects had been usefully discussed, opinions diffused, and a tone given to many of the local clubs, which must benefit agriculture. Some of their country friends had intimated to the committee of management that they looked to that club for something like the suggestion of a remedy for their present sufferings. The matter had been under consideration incidentally that day at the annual meeting of the club. It was then observed that there had already been several bodies of gentlemen associated together for the express purpose of endeavouring to devise means for remedying the distress which now oppressed agriculture; gentlemen of accredited influence in their respective districts, and possessing the confidence of those whom they represented. He had many years back recorded his opinion, and he had on more than one occasion repeated his conviction, that no beneficial result would arise from such associations. He very much regretted to find that he was right in that view, and he firmly believed that if a new organization were formed through the instrumentality of that club, and were to open communications with the various clubs throughout the country, he honestly told them that he believed such an effort would fail. Now it seemed to him—though it might appear a very bold expression to use—that nothing but patient endurance would test their position. To him it appeared perfectly clear that nothing but time could test it, and that the great experiment must be tried. There was one mode of action which he thought could and ought to be adopted. It was the only one that had suggested itself to his mind. He would say, in the words of an individual who, as a zealous free trader, they must consider opposed to them, "that man must be a madman who expected the same rent to be paid with wheat at 40s. per qr. as was paid with wheat at 56s." (Hear, hear). Whatever might be the result of the present state of things, he felt that at least three years must pass over before the trial which they had to endure would be passed through, and then the issue might still be doubtful; but of this there could be no doubt, that if they were to suffer during that period, if there was to be such a trial, they ought to take such steps as would have the effect of laying the burden upon the backs of all who ought to bear it (Hear, hear). He had never understood why, if cheapness was to be given to the nation at large with respect to one article, it should not be extended to all (cheers). He could not understand why they should, to use an old expression, be called upon to "make bricks without straw" (Hear, hear), for he did contend that to call upon them to pay the same rent as formerly, seeing the price of their produce had been reduced 25 or 30 per cent., was, in fact, calling upon them to "make bricks without straw." He would suggest that the members of the club should communicate with the committee, and that the committee should do what he had always thought of vast importance in the existing condition of agriculture, namely, show by authenticated statements what was the real position of the farmer—the farmer moderately placed both with respect to capital and to the nature of his occupation; what was the precise difference in respect to his expenses and his outgoings, and the raising of his produce now as compared with his situation when wheat was 56s. a quarter (Hear, hear). They had had various statements on all sides of the question; but although many such had been furnished to himself by parties desirous of affording information, he had never yet seen any statement which appeared to him thoroughly conclusive. Bearing in mind that there were parties who told them that they ought to produce wheat so as to pay even under present circumstances, he must say that nothing could more tend to bring home conviction to the minds of commercial men, who might, under existing circumstances, be considered their opponents, than the showing them, by an authentic statement, that that was absolutely impossible. It was all very well to say "You should do so and so," but in commercial matters—and that was a commercial matter—there was nothing like coming to pounds, shillings, and pence (Hear, hear). Let them endeavour thus to convince the landlords — of whom it was said, the other day, that those would act most wisely who took the step soonest—that they must prepare to share the burden (cheers). Let them show the tax collectors that they could not have as much as they had formerly; let them show the tithe-owners that they must accommodate themselves to times and circumstances; and let a similar lesson be taught with respect to county rates and other similar charges (cheers). Let a fair statement be prepared, showing the honest and real state of the case; and nothing would so effectually convince those who were now unconvinced, if they might judge from their obstinacy, that the position of the tenant-farmer was one which demanded immediate consideration. It was all very well to say that others suffered as well as themselves; but it should be borne in mind that the labourer was the first to suffer, the tenant-farmer the second, and those who ought to sympathize with the tenant-farmers the last (Hear). He had to apologize for having trespassed on their attention at such unusual length; but he felt that the times were peculiar, and it was some relief to him even to express his feelings on the subject. He regretted to say that during a twenty years' experience he had never yet found tenant farmers prepared to unite in such a manner as to secure their own interests. If any persons were found to be energetic in their own district they were not sufficiently supported by other districts. Unfortunately there was not amongst farmers that spirit of adhesion which was to be found in other classes of society; and the consequence was, that instead of having a voice in the making of the laws, they were generally used and treated just as others chose to use and treat them (Hear, hear). On behalf of the committee he begged to thank them for their expression of good-will towards the club; and he would conclude by expressing his hope that agriculture might eventually prosper despite its present difficulties (cheers).

Mr. Cobbold, M.P. for Ipswich, on rising to propose the next toast, said—Although he had the honour to be a member of that club, and of a farmers' club in his own locality, yet, in farming, he was, he feared, a mere amateur. The toast which he had then to propose was the health of a neighbour of his, one who commenced his career as a tenant-farmer, and whose personal character and general conduct had won for him the esteem of all with whom he had been connected. The neighbourhood in which he resided was justly proud of their chairman as a resident (cheers), as this club was proud of having him for a member, and that company of having him for its chairman. His reputation was not confined to his own county: it extended all over this kingdom, and he believed even beyond its limits; and as a grazier he might well be put forward to compete with the graziers of the north. (Hear, hear, and laughter.)

The toast having been cordially responded to,

The Chairman returned thanks. He said, if he was considered to have deserved their good opinion by his past labours in the cause of agriculture, it would certainly be his effort to maintain it by his future exertions. He could not but congratulate the company on the fact that, notwithstanding all the difficulties by which they were embarrassed, the club stood in so proud a position; and having always taken the greatest interest in its prosperity, he hoped yet to see it, what he had always anticipated that it would be, the representative of the great agricultural interest throughout the kingdom (Hear, hear). He could not quite concur with Mr. Shaw in the opinion that they were not to anticipate any assistance, whether from legislative measures or from other sources (Hear, hear). He knew that they had themselves to blame, to a great extent, for the past. The Legislature would not do anything for them, unless they came forward boldly and declared their real position; nor could their own representatives be expected truly to represent them unless, like the other great interests in the country, they told them what it was that they required; and that unless they did what was necessary under present circumstances, they must not look to be their representatives in future (Hear, hear, and cheers). He was sure his friend Mr. Pusey would excuse him for speaking thus plainly; indeed, he was very glad that the hon. gentleman was there, to learn the opinions of tenant farmers (Hear, hear). During the last twelvemonth landlords had not mixed with their tenantry as they ought to have done; but that was an additional reason why the tenantry should unite amongst each other. Sir James Duke had observed to him within the last two years, that if the agricultural body would form a committee of ten or twelve leading men, and through them chalk out some course which might be pursued, he had no doubt the House of Commons would listen respectfully to their plan, and if it were put into a practical shape it would carry with it more weight than anything emanating from the great body of the landowners. He (Mr. Hobbs) repeated his belief that they had themseves to blame for their present position. For himself he could say that he would be happy to render any assistance either in that club or elsewhere in support of the cause of agriculture, whether for its improvement or for its protection by means of legislative measures (cheers).

Mr. Emery proposed, "Prosperity to the Royal Agricultural Society," coupled with the name of Mr. Pusey. With regard to Mr. Pusey, he observed that all present must be aware of the great efforts which he had made to secure an adjustment of the question between landlords and tenants as to the outlay of money in the improvement of farms. Whether or not his labour would be vain time alone could show. To him it appeared that the tenant had as good a right to be protected as regarded the capital which he expended upon his farm as any merchant or tradesman had in the employment of his capital (Hear, hear). He had been watching the progress of this question in the House of Commons; and it was his firm belief that no very long period would elapse before some good legislative measure would receive the sanction of Parliament.

The toast having been disposed of,

Mr. Pusey returned thanks. He observed that it was at the desire of that club that he introduced the Tenant-right Bill into the House of Commons. Notwithstanding the difficulty which a private member always had in carrying a bill through the House of Commons, he succeeded in carrying that bill twice through the House; and he certainly was surprised to find that when the representatives of the people of England had sent a bill a second time unaltered to the House of Lords, that House was not prepared to give it a second reading. He thought if there had been any member of the House of Commons, who really understood the bearings of the measure, there would have been a greater debate in that House, and the result might have been different. For instance, when he stated that Mr. Jonas had tied up eighty beasts in the winter, and after fattening them had sold them at a loss of £2 per head, exclusive of the dung, he was quite laughed at. (Cheers). The best wish which he could leave for those who doubted the statement, was that they might have a thousand acres of land on their own hands (laughter), and have the satisfaction of tying up 200 beasts in October, and sending them up to Smithfield in February, without at the same time retaining the advantage to be derived from the dung. He would then wish them joy of their profit (laughter). An author of some note, Mr. Wingrove Cooke, had recently published a work on the relations between landlord and tenant, and in that work he found agreements provided which were applicable to different circumstances. The very fact of such a work having been published proved that the question was gaining ground, and that they had not laboured in vain. There was another country, viz., the sister country, in which the question of tenant right had been much agitated. If the Irish occupiers should succeed, their own success was certain. Whenever the Government took up this question for Ireland they might rest assured that the attainment of their own object was not far distant (Hear, hear).

Mr. Baker, of Writtle, proposed "Success to the Smithfield Club," which he said had, in his judgment, been extremely beneficial to agriculture, as well as to the country at large. It had been said that he who made two blades of grass to grow where only one grew before was a benefactor to his species. The Smithfield Club was, then, surely worthy of commendation for having improved the production of that which entered so largely into the consumption of the people. Within his remembrance the article of meat was comparatively small in amount, and far below its present quality. Fifty years ago the mass of the inhabitants of this country partook only to a very limited extent; now there were very few families who had not their joint on the table every day; and this change had taken place upon the same number of acres. How had the change been produced? By the exertions of the tenantry of England, combined with the application of their capital to the improvement of the soil. Attention had been drawn to the comparative merits of Scotch and English farming. He had never had an opportunity of witnessing Scotch farming; but he knew enough of the Scotch character to lead him to the belief that if they forgot to praise them they need not forget to praise themselves (Hear, hear, and laughter). There might be farms in Scotland which equalled any farms in England. But why? It was in the production of roots that the Scotch farmers excelled, and their superiority in that respect was owing to peculiar adaptation in the climate to the growth of roots (Hear, hear). He happened once to have a Scotch bailiff, who used to grow turnips for him on the Scotch system. He found that he could not grow them at all; whereupon he exclaimed that in Scotland turnips would grow of themselves (Hear, hear). As regarded the present position of the tenant farmer, he asserted fearlessly that farmers were making less of their produce by 30 or 35 per cent. than they did some years ago. He was quite satisfied that the good sense of the people of this country would bring the agricultural interest into the right position at last. With enormous taxation pressing upon agriculture, with taxes, direct and indirect, to the extent of 8s. or 10s. per quarter on every quarter of wheat produced, the intelligent inhabitants of this country could not long suffer their home-producers to compete long with foreigners. The common rules of justice, which governed the commercial and trading community, would not persist in subjecting them to the disadvantage of foreign competition under such circumstances. However, that was not a political club: he had always held that if it were so it would soon break up (Hear, hear). But they could not cast politics entirely overboard when their welfare was most intimately bound up with them (Hear, hear). They were now, as it were, in the current of events—carried on by a stream which they could not control. All that they could do, it appeared, was to resign themselves to the current, in the hope that at some future time it would cast them upon a shore which would be more favourable as regarded their own position and prospects.

Mr. Torr, of Riby, Lincolnshire, one of the stewards of the Smithfield Club, responded to the toast. He lamented that the club had been pooh-poohed by some of the most powerful members of the English press. The censures uttered, however, did not prove the littleness of this club, but the littleness of the party from whom it emanated. It was strange that the *Times* should not know that it did not necessarily follow that all animals were as fat as those exhibited, or, on the other hand, that if animals could not be got fat they were good for nothing. (Hear, hear.) Having frequently visited Scotland he had no hesitation in saying that the root-crops were superior to those of this country, but the Scotch could not grow such hay and grasses as were grown in England; neither, he believed, could they breed such good sheep as were to be found here. As regarded their present position, he would only remark that they were now sacrificed to the principle of cheapness; but he believed the unsoundness of that principle would be discovered even by the manufacturers themselves; and when that had been done, farmers would no doubt reap the benefit of the discovery.

Mr. Stokes, of Leicester, proposed "Success to Agriculture, Manufactures, and Commerce."

The toast having been disposed of,

Mr. Mechi replied. He said he hoped they would not congratulate themselves upon having arrived at the culminating point in cultivation. They had done much, it was true, but much still remained to be done; and it should be recollected that the population was increasing at an enormous rate.

Mr. Skelton, of Lincolnshire, proposed "The Committee of Management;" and

Mr. Trethewy, of Beds, replied.

Mr. Henry Overman, of Weasenham, proposed "The Local Farmers' Clubs."

The toast having been drunk,

Mr. Wm. Shaw, of Northampton, replied. He said he had heard many persons say, "Cultivate, cultivate, drain, subsoil." It appeared to him that under present circumstances such things had reached their limit. The tenant farmers could never do any good so long as the landlord might come in and make the first claim in preference to all other creditors (Hear, hear).

Mr. R. Smith, of Exmoor, proposed "The Secretary."

The toast was most cordially received.

Mr. Corbet briefly returned thanks.

This completed the list of toasts, and the company soon after dispersed.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A monthly Council was held at the Society's House in Hanover-square on Wednesday, the 4th of December: present, His Grace the Duke of Richmond, K.G., President, in the chair; Mr. Raymond Barker, Mr. S. Bennett, Mr. Brandreth, Mr. W. G. Cavendish, M.P., Colonel Challoner, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Fisher Hobbs, Mr. Kinder, Professor Sewell, Mr. Shaw, of London, Mr. W. Simpson, Mr. C. Hampden Turner, and Professor Way.

The following new members were elected:

Andrew Arcedeckne, Esq., of Grosvenor-square, and Glevering Hall, Suffolk, was elected a Governor of the Society.

Alexander, Horace, Surinam-terrace, Stratford, Essex
Aveling, Thomas, March, Cambridgeshire
Aytoun, Marriott, Coates's-crescent, Edinburgh
Badham, G. D., Sparrow's Nest, Ipswich, Suffolk
Barrow, John James, West Burton, Gainsborough, Lincolns.
Bennet, R. G., Tresillian, Newlyn, Truro, Cornwall
Bolton, Thomas, Ballykisteen, Tipperary, Ireland
Clark, Henry, Berkeley-square, Bristol
Clifford, William, Parliament-street, London
Dalton, Thomas, Cardiff, Glamorganshire
Dashwood, Maitland, Scotsborough, Tenby, Pembrokeshire
Davis, Richard Francis, 34, Connaught-square, London
Easton, James, Grove, Southwark
Ewbank, Charles W., Port Eliot, St. German's, Cornwall
Gadesden, James, Ewell Castle, Surrey
Goring, Rev. John, Wiston Park, Steyning, Sussex
Gosford, Vincent, Cheriton, Alresford, Hants
Heath, R. Liverpool
Humphreys, Henry, Beaumanor-park Farm, Loughborough
Hymers, Robert, Marton, Stockton-on-Tees, Durham
James, John, Whitechapel-road and Leadenhall-street, London
Kelsall, Henry, jun., Rochdale, Lancashire
Lewis, Wyndham William, The Heath, Cardiff, Glamorganshire
Lloyd, Francis Edwardes, Kilybebil, Swansea, Glamorganshire
Mahon, H. Sandford Pakenham, Strokestown, Roscommon
Midgley, W. H., Ercall Park, Wellington, Salop
Morgan, Lewis, Hafod, Pont-y-Prydd, Glamorgan
Parrington, Thomas Marton, Cleveland, Durham
Permewan, Nicholas, jun., Trevethow, Lelant, Hale, Cornwall
Peto, Samuel Morton, M.P., Somerleyton Hall, Suffolk
Piercy, Alfred, Hurley, Marlow, Bucks
Price, John Robinson, Westfield-farm, Montrath, Ireland
Randolph, James, Milverton, Somersetshire
Rowley, Hon. and Rev. Thomas, Rhydorddwy-Faur, Flintshire
Rutter, James, Roxwell, Chelmsford, Essex
Simpson, William, Kirby-Grindalyth, Sledmere, Yorkshire
Sims, Thomas, Downiehills, Peterhead, Aberdeenshire
Smith, Parker, Caythorpe, Grantham, Lincolnshire
Stewart, Arthur, Stafford-terrace, Heavitree, Exeter
Strode, James Cranbourn, Hollington, Hastings, Sussex
Stuckey, Walter (Banker), Grove Cottage, Yeovil, Somerset
Summers, George, Stoke-Wake, Blandford, Dorset
Watson, Henry, Londonthorpe, Grantham

The names of 10 candidates for election at the next Meeting were then read.

Finances.—Colonel Challoner, Chairman of the Finance Committee, presented to the Council the monthly report of the accounts of the Society; from which it appeared that, at the end of the previous month, the current cash-balance in the hands of the bankers was £769.

Guano.—Viscount Palmerston, Her Majesty's Principal Secretary of State for the Foreign Department, transmitted to the Council, through Lord Stanley, of Alderley, important documents connected with the supply of Guano to this country, founded on a communication of facts resulting from inquiries instituted by

Lord Palmerston's special instructions in reference to that important question. At the request of the Council, the Duke of Richmond, as the President of the Society, and as feeling anxious under any circumstances to promote measures by which a more abundant and a cheaper supply of valuable manure may be furnished to the practical farmers of this country, kindly undertook to confer with Lord Palmerston on the subject, and to report to the Council the result of such interview with his Lordship.

Show of 1851.—The Council gave directions for the General London Committee of the Society to be summoned to meet on Wednesday next, for the consideration and despatch of business connected with the Society's arrangements for their show of breeding stock in Hyde-park next year.

The Council then appointed the standing Committees for the year 1851, and adjourned to their weekly Council on Wednesday, the 11th of December, at 12 o'clock, at which, as usual, all members of the Society would have the privilege of admission for the reading and discussion of papers connected with practical points in agriculture.

The Half-yearly General Meeting of the Members was held at the Society's House, in Hanover Square, on Saturday, the 14th of December. His Grace the Duke of Richmond, K.G., the President, in the Chair. Mr. Hudson, the Secretary of the Society, by direction of the President, read the following Report from the Council:—

The Council have again the satisfaction of reporting favourably of the progress made by the Society in the attainment of its practical and useful objects. The number of its members at the present time differs by only 18 from its amount at the date of the last general meeting, 174 names having been removed by death or otherwise from the list, while 156 new members have, during the same period, been elected into the Society, which now consists of—

90	Life Governors,
167	Annual Governors,
648	Life Members,
4315	Annual Members, and
19	Hon. Members,

making a total of 5,239.

Among the Governors lost to the Society by death, the Council have to record a name illustrious from its connection with the Royal Family of England, and endeared to the nation as borne by a Prince distinguished by so many virtues as H. R. H. the Duke of Cambridge; a name, too, familiar and friendly in an especial manner to the Royal Agricultural Society of England, on account of the deep interest taken by H. R. H. in the formation and welfare of the Society, and his participation in the promotion of its country meetings.

The Council have to report favourably on the state of the Finances of the Society; and to submit to the Members the Half-yearly Balance-sheet of the general account, and the Special Balance-sheet of the Country Meeting at Exeter, along with the quarterly statements of income and expenditure, assets and liabilities, funded property, and current cash account, laid before the Council by the Finance Committee and Auditors.

The *Journal* of the Society, transmitted postage-free to the Members in August last, will have borne to them in its own pages the best evidence of its intrinsic value. The succeeding part, now on the eve of publication, will no less, the Council believe, sustain the high character of its predecessor, and still further evince to the Society the high privilege its Members enjoy in being favoured with so large an amount of the devoted attention of Mr. Pusey, who, in his capacity of Chairman of the Journal Committee, effects that selection, arrangement, and elaboration of matter for its pages, which results in so valuable a collection of data for immediate application in given cases, and for the further advancement of agricultural knowledge. "Books," it is true, as Mr. Pusey himself remarks, "will not teach farming; but," he adds, "if they describe the practices of the best farmers, they will make men think, and show where to learn it. If our farmers will inquire what is done by the foremost of them, they will themselves write such a book of agricultural improvement as never was written elsewhere, in legible characters, with good straight furrows, on the broad page of England." The Council trust that the best practice, whether obtained from the pages of the Journal or from personal inspection of the best farming, will be thus transferred to the hitherto-neglected lands of the kingdom, and lead to results alike satisfactory to all parties connected with them. The Council are gratified to find, that of all the Journals sent to the Members by post, amounting in number to nearly 30,000 copies, only one case has been made known to them in which a Journal has not eventually reached its destination: they regard this fact as both important to the Society, and as reflecting the highest credit on the postal establishment of the country.

The Council have only to refer to the Country Meeting of the Society, held at the City of Exeter in July last, with the liveliest satisfaction, and to pronounce it as complete in all its details as the Council could desire; the excellence of that meeting having been witnessed by all who had the pleasure of being present at it, and made known by public report to all others interested in its success who were from various causes unavoidably absent. Those only, however, that were present on that occasion could be impressed with an adequate idea of the demonstrations of hearty welcome given to the Society by the inhabitants of that "ancient and loyal city"; an expression of respect only equalled by their disinterestedness and genuine hospitality. The mayor and corporation, and the local committee, anticipated by their prompt and judicious measures every wish of the Society during the preparations for the meeting, and the period of holding it. Sir Thomas Acland at Killerton, and Mr. Turner at Barton, each gave a kind and friendly reception to the Members, and submitted to their inspection their respective Water and Catch Meadows, which created a lively interest in all who witnessed them. The principal Railway Companies, with their usual liberality, conveyed the live-stock free along their respective lines to and from the Show, and the implements at half the ordinary rates. The Members were indebted to Prof. Simonds for a valuable Lecture on the Diseases of the Liver in Domesticated Animals. Messrs. Tuxford, of Boston, and Messrs. Barrett and Co., of Reading, kindly placed at the disposal of the Stewards and Judges their respective steam-engines, for driving the machinery under trial in the Show-yard. The Society conveyed to all these respective parties at the time their grateful acknowledgments for the valuable services they had rendered to the Society by their cordial co-operation. The Exeter Meeting was also distinguished by a still further improvement introduced into the dynamometrical testing of the agricultural machinery, by which new results, of great importance in guiding the Judges in their decisions, were obtained; and the rival exhibitors of implements enabled themselves to judge of the actual power and working of their machines by simple inspection of the mechanical registration of results. Colonel Challoner, the Senior Steward of Implements on that occasion, has made to the Society his report of the exhibition and trial of implements at the Exeter Meeting, including a description of the testing apparatus employed, and diagrams illustrating the momentary variation of the actual power either possessed by the steam engines as prime movers, or required to work the various agricultural machines submitted to the test of trial. If anything were further required to prove the excellence of the Exeter Meeting, it would be the occurrence, for the first time in the records of the Society, of the receipts being equal to, or exceeding the payments on account of, a Country Meeting, independently of the Prizes awarded on the occasion; the Exeter Balance Sheet now laid before the Members showing a balance of £96 2s. 9d. in favour of the Society.

The Council, agreeably with the Bye-laws of the Society, prepared, on Thursday last, a List of the Prizes for Breeding Stock, to be offered for competition next year. This List having been printed, copies of it are now laid on the table for the information of the members.

The Council have appointed a Special Committee to take into consideration the whole question of nominating, selecting, and appointing the Judges for the Country Meetings, with a request that they will favour the Council with their report on the subject in February next. They have also appointed a certain number of their members to meet the Governors of the Royal Veterinary College, for the purpose of conferring with them on the best mode of carrying out the common object of the two bodies, namely, the application of veterinary science to the diseases of cattle, sheep, and pigs; with a request that they will report the result of their conference at the same date. Professor Simonds, the Veterinary Inspector of the Society, has reported to the Council the result of his inquiry into the occurrence of several important cases of disease amongst the stock of members in different parts of the country. These reports, when fully completed by further results of direct experiments in the feeding and treatment of the animals, will be placed in the hands of the Journal Committee.

Professor Way, the Consulting-Chemist to the Society, has continued to prosecute his interesting researches on the chemical constitution of plants and substances of agricultural use, the results of which are in the course of publication in the Journal of the Society. Prof. Way has also favoured the Society since the last General Meeting with a Lecture on the Chemical Character of Water as connected with its agricultural uses.

The Council have decided, since the last General Meeting, to give Prizes for Essays on the following subjects, to be sent in by the 1st of March next:—

Farming of Shropshire	£50
Farming of Northampton	50
Diseases from mismanagement of Horses	20
Diseases of Cattle after parturition	20
Agricultural Geology of England and Wales	50
Production of Butter	10
Any Subject in Agricultural Chemistry	20

The Council have been favoured by Viscount Palmerston with important communications on the subject of the supply of Guano; and the Duke of Richmond, feeling the great importance to the farmers of this country, that so valuable a manure should if possible be supplied, not only in its genuine state, but in abundance, and at a cheaper rate, has kindly undertaken, at the request of the Council, to confer with Lord Palmerston on the subject.

By order of the Council,
JAMES HUDSON,
London, Dec. 14*th*, 1850. Secretary.

The Rev. JAMES LINTON said he rose with great pleasure to move the adoption of the able report which had just been read. He was sure the thanks of the Society were eminently due to those who conducted the machinery of its operations, his Grace the Duke of Richmond, and the Members of the Council, to whose exertions they were indebted for the Society's present prosperous condition. Their thanks were also due to the Professors. In mentioning one of those gentlemen in particular, he had no intention to detract from the merits of the rest; but he could not help saying how much they were indebted to Professor Way, both for his lecture on the filtration of water, and more particularly for that on the adulteration of guano. In the last mentioned lecture he had shewn in the clearest manner how easily guano might be adulterated, how difficult it was to detect adulteration, and how easily the agriculturist was deceived when dealing with the small retail dealer, who sold it in small quantities at a lower price than genuine guano could be obtained wholesale. He was glad to hear what was said in the last part of the report with regard to the future importation of guano into this country. He had perceived in the agricultural newspapers that some discussion had taken place on the subject in the Council of that Society; and being a practical farmer himself, and having used guano for some years, he knew scarcely anything which would tend more to benefit the farmer than the importation of guano into this country at a more reasonable rate. He believed that at that time the inhabitants of Peru enjoyed a monopoly of that article; their accredited agents in this country selling it at no less sum than £9 per ton; and as there was so great a quantity of guano in Peru that the article was there almost valueless, it might of course be exported much cheaper than it was (Hear, hear). Not only would a reduction in price benefit the agricultural interest, but it would also benefit the government of Peru, for the export might be made so large as to fill their coffers. He hoped the Council would take some means of pointing out to the Peruvian government the great advantage it would derive from allowing a greater quantity to be exported at a less price (Hear, hear).

Mr. PETER LOWE seconded the motion. He fully concurred in the mover's praise of the Council, but he thought the Stewards of the Yard also deserved thanks for the arrangements which they had made with regard to the Show-yard. He could speak confidently of the exertions of Colonel Challoner, who was equalled by few and excelled by none in carrying out the objects of the Society in the yard. Having acted as a judge under that gentleman, he had derived great assistance from him. Without good stewards, the objects of the Society could not be carried out successfully, and therefore their acknowledgments should be made to those who so well performed their duties.

Mr. WINGATE supported the report, and in doing so expressed his sense of the value of the services rendered by the Council, as well as his gratification at the fact that the Exeter meeting had been so managed as to cover its expenses.

The motion was then agreed to.

COLONEL CHALLONER then read the general balance sheet.

HALF-YEARLY ACCOUNT ENDING 30TH JUNE, 1850.

RECEIPTS.

	£	s.	d.
Balance in the hands of the bankers, 1st Jan., 1850	1,042	17	11
Balance in the hands of the secretary, 1st Jan., 1850	0	2	6
Dividends on stock	160	6	1
Life composition of governor	40	0	0
Life compositions of members	267	0	0
Annual subscriptions of governors	710	0	0
Annual subscriptions of members	3,201	1	0
Receipts on account of Journal	195	4	5
Receipts on account of country meetings	1,471	19	0
	£7,088	10	11

PAYMENTS.

	£	s.	d.
Purchase of stock	1,247	0	0
Permanent charges	170	12	6
Taxes and rates	18	2	2
Establishment	635	4	3
Postage and carriage	20	6	4
Advertisements	3	12	0
Payments on account of Journal	1,415	5	8
Chemical grant	100	0	0
Chemical investigations	100	0	0
Prizes	248	10	6
Payments on account of country meetings.	651	3	11
Repayment of sums transmitted in error	18	1	0
Sundry items of petty cash	5	11	8
Balance in the hands of the bankers, 30th June, 1850	2,435	3	8
Balance in the hands of the secretary, 30th June, 1850	19	17	3
	£7,088	10	11

(Signed) C. B. CHALLONER, *Chairman*,
THOS. RAYMOND BARKER,
THOMAS AUSTEN, } *Finance Committee.*

Examined, audited, and found correct, this 13th day of Dec, 1850.

(Signed) THOS. KNIGHT,
ROBT. BEMAN, } *Auditors on the part of the Society.*

It was, said the Colonel, desirable to explain that £1,400 of the balance in the hands of the banker on the 30th of June was absorbed in prizes payable on the first Wednesday in August. He then read the following cash statement, with regard to the Exeter meeting:—

SPECIAL COUNTRY MEETING ACCOUNT: EXETER, 1850.

Note.—The sum of £1,725 as the amount of PRIZES awarded by the Society in the year 1850, is not included in this special Account as an expense attending the Exeter Meeting, but is made chargeable in the General Account as a payment out of the common Funds of the Society.

RECEIPTS.

	£	s.	d.
Subscription from Exeter	1260	0	0
Pavilion Dinner Tickets	501	10	0
Show-yard Receipts	2576	19	4
Sale of Catalogues	323	5	0
Sale of Council Badges	6	0	0
Sale of Wheat, after trial of Implements	61	12	0
Share of Implement Shedding paid by Exhibitors	211	19	0
	£4941	5	4

PAYMENTS.

	£	s.	d.
Pavilion	540	0	0
Contract for Pavilion Dinner	442	0	0
Expenses connected with Pavilion Dinner	59	16	6
Show-yard and Trial of Implements	2610	15	2
London Police	110	2	0
Judges	366	2	6
Consulting Engineer	102	8	4
Printing, Paper, and Stitching of Catalogues	199	2	0
Printing for the general purposes of the Meeting	87	15	3
Advertisements	238	9	0
Other charges	88	11	10
Balance carried to the credit of the General Funds of the Society	96	2	9
	£4941	5	4

(Signed) C. B. CHALLONER, *Chairman*,
THOS. RAYMOND BARKER,
THOMAS AUSTEN, } *Finance Committee.*

In reference to this statement he observed that that year the implement contributors had for the first time paid for the use of shedding. He could not but consider the decision of the Council on that subject a very wise one; and that was indeed proved by the fact that £211 had been received under that head.

The two statements were then laid on the table.

On the motion of Mr. E. Toll, seconded by the Rev. James Linton, Messrs. Knight, Beamer, and Barker, were elected as auditors for the ensuing year.

The Rev. James Linton moved, and Mr. Peter Lowe seconded, a vote of thanks to Professor Way for his lecture to the Society on water.

Mr. M. PHILIPS hoped he would be permitted to make a suggestion to the Council with regard to a matter of some importance. He had found that in Liverpool it was impossible for a farmer to purchase guano genuine, except in a case which did not often occur. There was here, in fact, one of those extraordinary contradictions which were often discovered in such cases. He believed the fact to be, that the large importers would not condescend to deal in a smaller quantity than 30 tons, and if a farmer wanted less he must purchase of some other person. In the first instance, of course, the guano came into the hands of the importer; but the farmer, who could not take 30 tons, was obliged to go to some other party for whose honesty he had no guarantee. That society had done a great deal to foster chemical analysis, but unfortunately it had not touched the point of importation; and he thought that as the funds of the Society were in a very satisfactory state, it would not be too severe a draw upon them if the Council were to appoint some individual in the port, for example, of Liverpool, whose certificate might satisfy the farmer that he would purchase genuine guano in that port (Hear, hear). Of course he did not wish that the farmer should not pay something for the analysis (Hear, hear). What he desired was, that there should be some recognised party, whose certificate would be sufficient to satisfy him that he could obtain a genuine article. For want of some such security, farmers were constantly being held back from purchasing guano. He had himself heard of a person being employed in Liverpool in what he termed the service of a guano manufactory. He was seen carting sand; and when asked what he did with it, he replied that he got a very good living by carting sand to a guano manufactory (Hear, hear). This, of course, caused very great loss to agriculturists; and if some such a plan as he had suggested were carried out, it would, he believed, be attended with very great benefit to the practical farmer (Hear, hear).

Mr. BARKER, a Member of the Council, said that on the occasion of Professor Way's lecture being delivered, a discussion took place on the subject of guano; and it was then suggested that farmers should combine together so as to be able to take thirty tons of genuine guano, and then divide it amongst them. He felt bound to observe, on behalf of the Finance Committee, that they were pecked at in all directions (laughter). He was afraid that the suggestion could not be usefully adopted. They might do a great deal of harm by releasing people from the necessity of watching for themselves, and by placing persons at the corner of every street to see that poor John Bull was not humbugged (laughter).

Mr. Shaw said: A plan was adopted in London, which might perhaps be imitated in Liverpool, if not in smaller towns. There was a house in London—he did not wish to mention the name, lest he might be considered to give them an undue advantage over their fellow-men—there was a house of guano-sellers which always gave a certificate that the guano went direct from the warehouse of the importer. The principle adopted seemed to afford ample protection; for not a single cwt. was taken out of Messrs. Gibbs' stock without a certificate being supplied with it. He presumed that there would be no apprehension of adulteration on the part of the importers—(Hear, hear)—it took place after the guano went out of their hands. If farmers generally, and all persons who wanted guano, would enforce that course on the dealers, they would thus entirely protect themselves against adulteration.

Mr. Wingate, of Lincolnshire, renewed the promise which he made a year ago, to assist any agent whom the Council might employ to collect the subscription arrears in that county.

The Chairman said that the Council were always very happy to hear suggestions from Members of the Society. The suggestions which had been made that morning would be brought before an early meeting of the Council, and the best consideration would be given to them.

The motion was then adopted.

Sir Robert Price, M.P., then moved a vote of thanks to the Chairman. He observed that it was quite unnecessary to say anything in favour of that motion. (Cheers.) His Grace was so well known to the yeomanry of this country, and his efforts for the improvement of agriculture so well appreciated, that by them, as well as by agriculturists generally, such a motion was sure of being cordially received.

Mr. Williams said there was a subject which he had intended to introduce that morning, and he would have done so before had he been aware that the gentleman who had just spoken was about to propose a vote of thanks to his Grace for the able manner in which he discharged the duties of the office of president. He stood before his Grace as a member of that Society, and he had been proud to be a member of it, and he bore testimony to the able assistance which it had rendered to the science and the practice of agriculture. But he attended there that day to protest against the part which the Society had taken in fixing upon Hyde Park as the place at which its annual show was to be held in 1851. It was thus holding out the right hand of fellowship to that measure which had been designated by the *Morning Chronicle*—an organ of the free-trade party—the inaugural festival of free-trade.

Sir Robert Price rose to order. That Society was, he observed, formed upon the distinct principle that they should not discuss any political subject, and no one present could say that the question introduced was not entirely political. He was quite convinced that the Society depended for its very existence on a total abstinence from political discussion (Hear, hear). If they once made it an arena for such discussion, its usefulness as a society would be gone, and from that moment they might as well altogether dissolve (Hear, hear). He did hope that Mr. Williams—who was, he doubted not, actuated by good motives—would not proceed with a subject which would lead to difference of opinion, and do more mischief to the Society than anything else that could be conceived. The Society was now going on remarkably well, because there was a total abstinence from politics, and because they met there only for the consideration of matters in which they had a common interest as agriculturists (Hear, hear).

Colonel Challoner must remind the meeting that political discussion was contrary to the Society's charter, and was quite sure that nothing would be allowed which was opposed to that document.

Mr. Williams said he had no wish to introduce politics into that room; his only object was to vindicate his consistency in tendering his resignation as a member of this Society; he wished to justify the act he came there to perform. He had desired simply to show that there had been a want of consistency on the part of the Society, and not to broach politics. The Society had supplied him, as an individual, with a considerable amount of information, for which he should ever feel thankful; and to Mr. Pusey especially, as the editor of the "Journal," he was especially grateful for the solid, practical, and substantial information which he had furnished to farmers (cheers). But he was a man of consistency, and he wanted to know whether there had not been some inconsistency in that Society (which included fifty-nine members of the House of Commons) telling him, as a British farmer, to make use of science, and to invest additional capital in the cultivation of the soil, when the British Legislature had reduced the value of his produce by one-third.

Sir Robert Price: This will never do.

Mr. Williams: I am only giving a justification of myself.

The Chairman here interposed. He said he regretted that this discussion had taken place, but he was not surprised at it. He must, however, call upon Mr. Williams to remember that the Society forfeited its charter by allowing anything like political discussion (Hear, hear). That gentleman had an undoubted right to complain of the Council's having determined to hold the show in Hyde-park, because that was not politics; he had a perfect right to say that it ought to be held in some other place. Where he got out of order was in making allusion to politics, and referring to an expression in a newspaper. He hoped he would not resign. He (the Duke of Richmond) had thought it would be best for them to hold their show next year, as heretofore, in the country (Hear, hear). One great advantage of holding it in the country was that it enabled many small tenant-farmers to come to it who could not afford to be members of the Society, and presented an opportunity for farmers and landowners to mix together at the dinner. If his vote alone could have decided the matter, it would have pleased Mr. Williams. He would, however, assure the hon. gentleman that he ought not to believe all that he read in public prints, or to imagine that the fact of the Royal Agricultural Society's holding its show next year in Hyde-park bore out any of those reports which were perhaps industriously circulated amongst the tenant-farmers of the country. On the contrary, he believed the majority who decided in favour of Hyde-park did not intend that the Royal Commission should have anything to do with that show; and when it was determined that the show should be held in London, it was at the same time distinctly stated that it was to be managed in conformity with their own rules and regulations (Hear, hear). So far from there being any political triumph to their opponents, he believed one result would be that foreigners who might attend the show, and see what could be done by the energy and the perseverance of the honest and intelligent yeomanry of England, would feel that they deserved a far better fate than they had received at the hands of their own legislature (Hear, hear). He hoped the hon. gentleman would reconsider his determination, as he assured him that no political move whatever was intended—(Hear, hear)—and he trusted that the yeomanry and tenantry of England would never resign their membership of such a Society on any such ground. Let Mr. Williams recal his resignation, and not give their enemies a triumph by persisting in it. At the present moment they must all row in the same boat.

Mr. **Williams** said perhaps the Chairman would now allow him to finish the expression of his sentiments without treating at all on politics (Hear, hear). Through the step which the Council had taken, he found that if he viewed the implements at all next year—and as a practical farmer he considered them of equal importance with the Cattle Show—he must subscribe to that which from the bottom of his heart he despised. He could not see those implements without entering the glass building which, if he might express his opinion, he would say appeared to him the monument which was being erected to England's folly. As he could not subscribe to that scheme, he had by the act of the Council been debarred from inspecting the implements. He thanked his Grace for having voted in the minority, for he had been informed on good authority that such was the course which his Grace had taken; but he still thought he could not consistently remain a Member of a Society which advocated science and practice without looking to the protection of their interests. He should therefore resign, and transfer his subscriptions from that Society to another, of which his Grace was also the president—The National Society for the Protection of British Industry.

Mr. **Mark Philips** then seconded the motion of thanks to the Chairman.

The motion having been carried unanimously,

His **Grace** said he could assure them that he accepted the office of President of that Society, for the third time, with feelings of the greatest satisfaction. He felt it to be no slight honour to be the President of a Society which was engaged in so extensively promoting the improvement of agriculture; and he certainly would not have consented to continue President if he thought that the holding of the Show in London next year had any political object (Hear, hear). Happily he had frequent opportunities of attending meetings at which politics were freely discussed; and he did not think it at all a hardship that on one or two occasions in the year they met to discuss questions which had reference solely to the improvement of agriculture (cheers).

The meeting then separated.

THE SMITHFIELD CATTLE CLUB.

THE ANNUAL DINNER.

The annual dinner of the members and friends of the Smithfield Cattle Club took place on Friday, Dec. 13, at the Freemasons' Tavern, the Duke of Richmond in the chair. Upwards of 100 gentlemen were present; and amongst them we observed the Earl of Hardwicke, Col. Sibthorp, M.P., Captain Sibthorp, Admiral Sir O. Pell, Mr. C. T. Tower, Mr. Henry Wilson, Mr. J. Villiers Shelley, Mr. H. Brandreth, Mr. Edward Tull, Mr. R. Barker, Professor Simonds, Mr. W. F. Hobbs, Mr. Mechi, Mr. Worthington, Mr. Bennett; Mr. B. Gibbs, Hon. Secretary, and Mr. J. Hudson, Secretary, to the Royal Agricultural Society of England; Mr. Willmore, Whetstone, Leicestershire; Mr. Moor, Mr. Druce, Mr. Torr, Mr. Wingate, &c.

On the removal of the cloth,

The noble **Chairman** rose, and having intimated that all political discussions were strictly prohibited by the rules of the club, proceeded to give "The Health of her Majesty the Queen." In doing so, his Grace said he felt that he ought to inform those gentlemen who had not been present at their meeting that her Majesty and her Royal Consort having expressed their desire to witness the show of the club, he (the Duke of Richmond), as president, after consulting with the honorary secretary and stewards, had informed her Majesty that she might visit the yard at the time the judges were engaged in the performance of their duties; her Majesty, with that feeling which had ever characterized her, being anxious not to have the yard closed at a period when the doing so would infringe upon the convenience of the public, who she knew invariably sought admission there (Hear). The club unanimously thought that the conduct he had pursued was right, and passed a resolution which in future would permit him to conduct her Majesty over the exhibition simultaneously with the judges (Hear, hear). He was happy to say that the Queen and Prince Albert had expressed themselves very much pleased with what they saw (cheers); and he had now the utmost pleasure in proposing to them to drink "Long Life and Prosperity to the Queen." Might she long continue to be an example for imitation by all her subjects, and reign over a free, a happy, and a religious people (loud cheers).

The next toast was "Prince Albert, the Prince of Wales, and the other branches of the Royal Family."

The **Chairman.**—The next toast is "Success to the Smithfield Cattle Club" (loud cheers). I am quite sure that it will gratify every member of the club to know that, however flourishing were our finances at this time last year, they are in a still better condition now (cheers). We, unlike many clubs, and I am afraid unlike many individuals, have in hand enough to pay the premiums of next year, without infringing upon any of the subscriptions (loud cheers). I only wish that a larger number of clubs and of the various classes of our fellow-subjects were in the same prosperous condition. It is impossible, I think, for any one who has visited the show-yard not to agree with the judges and with other old members of the club in admitting, that the show was not only more numerous than it has ever been upon any former occasion, but that it possessed very great merit indeed. In the cattle class it was very good; in Leicester sheep it was particularly good; and we had upon this occasion in the crosses some of the most splendid animals in sheep that ever were shown in this or in any other year (cheers). I will not say much about the Southdowns, because, having got one or two prizes and one premium, you would think that in praising them I am praising my own flock. But I must remark that I never saw a more numerous or a better show of sheep; and I believe my friend Mr. Jonas Webb, who has so often carried off our prizes, but who, I am happy to say for us little men, could not show on this occasion, as he was a steward of the yard, will agree with me that it was a show very creditable to the Southdown flock-masters (cheers). This brings me to call your attention to one thing in particular which has been taking place of late years. Many of the farmers think it right, and they think it is to their profit also, and I agree with them, that they should take the first cross, because it pays them the best. You must remember, however, that there must be an end to that; for if the large flockmasters and the large short-horned and other Hereford and Devon breeders do not take care to keep up the purity of the stock, by continual crossing, we shall find before long that we are in a worse state than we were fifty years ago (Hear, hear). I allude to this because the attention of the Royal Agricultural Society of England has been directed to it. And I am happy to say that they are most liberally disposed, as far as their funds go; and that yesterday morning they voted £1,800 as prizes for cattle, horses, and sheep, in 1851, and that these prizes being for lean stock, will be given only to the pure animals. By this means, and by the landowners and farmers taking care to preserve the stock pure, I hope they will be enabled to benefit the farmers, and that the pure stock of the country will not be entirely destroyed (Hear, hear). I feel that I ought not to take up your time longer in proposing the toast. I am certain the success of the club will continue so long as it is supported by the great body of the present industrious and intelligent tenantry of the country (loud cheers). It is to their support that we owe our present success, as well as the success of the Royal Agricultural Society of England; and I have great pleasure therefore in calling upon you to drink "To the Smithfield Cattle Club" with three times three.

The noble CHAIRMAN then read the awards of the judges in the various classes, and gave in succession:—

"The Successful Competitors in oxen and steers," for which

Mr. HEATH, of Ludham, Norfolk, whose splendid ox won the first prize and the gold medal, returned thanks.

"The Successful Competitors for cows and heifers."

Mr. STEPHEN GOOCH, of Norwich, returned thanks.

"The Successful Competitors in long-woolled sheep."

"The Successful Competitors for short-woolled sheep," to which

Mr. WILLIAMS, jun., responded on behalf of his father, who was prevented attending the dinner by indisposition, and who, Mr. W. observed, would feel the greater satisfaction in receiving the prizes awarded to him, inasmuch as he had but a very small flock from which to make a selection (Hear, hear).

"The Successful Competitors in pigs."

"The Successful Competitors in extra stock."

The Earl of HARDWICKE, in proposing "The health of the Chairman," said that, whether before his face or behind his back, they had but one opinion of the noble duke, his honour, his truly English character, and the zeal and earnestness with which at all times he supported the interest with which the club was chiefly connected (cheers). He knew very well that in such an assembly as was then before him, there were many subjects which, fortunately by the rules of the club, he was precluded from mentioning. But whenever he entered the City of London for the purpose of dining with its citizens, or with his agricultural associates, he invariably looked around him, in order to see how things appeared under the legislation of an experimental character which was now in operation; and he must say, in viewing this society, he did not think that there was that remarkable fatness which had been described as peculiarly belonging to the agricultural classes (a laugh). He was led to believe, therefore, that they were under some pressure of some description or other, or else that they were not chiefly associated with the agricultural classes. Be that as it might, however, he was still gratified in beholding so numerous a body of the supporters and friends of the Smithfield Cattle Club assembled together on that interesting occasion. In the presence of so many practical agriculturists, he felt sure that he could say nothing which would add to their information, particularly as he understood that that distinguished agriculturist, Mr. Mechi, was amongst them, and in that gentleman's presence to attempt to dilate upon improvements in or the advantages of any agricultural process would be perfectly useless (a laugh).

The toast was drunk with three times three and one cheer more.

The Duke of RICHMOND.—Gentlemen, I return you my best thanks for the very flattering way in which you have received the toast. It is now for a great many years that I have constantly attended the meetings of this club. Before I was first elected your president I invariably supported the late Earl Spencer when he filled the office, and of whom I say, that no greater friend or warmer supporter of this club ever existed (Hear, hear). Since his death I have had the honour of being annually elected to this chair, and my only fear has been that having so often taken it, at last you would find yourselves tired of listening to one who has but little to say, except to assure you, and the agricultural interest of the country, that I never can be lukewarm in anything that promotes the improvement of that great branch of national industry (cheers). It gives me infinite pleasure to meet the farmers of England whenever and wherever I can have an opportunity of doing so; for I may say that I have never in my life attended a meeting of that class at which they have not paid me compliments far higher than I had any claim or right to expect (loud cheers). I am very much obliged to those experimental agriculturists who give us the benefit of their practical knowledge. Lord Hardwicke has alluded to Mr. Mechi, who is now present. I am glad to find that that gentleman comes here to dine with a body of practical farmers, to whom I am very much obliged for trying their experiments, because I pay not the piper (Hear, and a laugh). I care not, therefore, whether these experiments succeed in a pecuniary point of view or not; but it is of great importance that the experiments should be tried, and that we should know the cost; then we will follow Mr. Mechi and any other gentleman, as far as we think we can afford to do so (Hear, hear). I have always thought that the trying of an experiment, even if it fails, is of signal advantage; for it shows us the rock which we must steer clear of (cheers and laughter). I entirely coincide with the general rule and practice of this club with respect to eschewing political subjects at our meetings. For myself, if I want to express my opinions, I have not far to go where I can express them freely and frankly; and I happen to be one who, when he has adopted an opinion—I hope I do not do so without fair consideration—it is not easy to make gib or go from it (loud cheering). I am quite sure that the Smithfield Cattle Club has been of great service to the interest of farming. It was in this very room—and here on my left is a friend of mine (Sir Oswald Pell), who has since served his country in the navy in many parts of the world, and who was then present—

where we first broached the formation of the Royal Agricultural Society of England (cheers) Gentlemen, it is not only in your show-yard that you may see whether we have been of any service or not; but you must remember the number of clubs in every part of the country which have been established upon your principle (cheers). Nay, if any man doubts that we have improved the breeds in this country, let him go into any country market, and I will answer for it he will agree with me that we have done great service. (Hear, hear.) We do not require to fatten all our animals to the same extent that we do in the Smithfield Club; but we do want to show the farmers those breeds which have the greatest aptitude to fatten. If I am asked, what is the use of bringing your Southdowns so fat as this? my answer is, that they have such an aptitude to fatten that we cannot keep them lean. But it will be said, perhaps, "It does not pay you." Pay you! Why, one-half of the pursuits which one is obliged to be engaged in do not pay. (Hear, and laughter.) I say this, however, that it does pay a flockmaster; and I was glad to hear from Mr. Williams, the son of the gentleman who gained the gold medal, that he had only a small flock to select from. (Hear.) It is all the more creditable to him, and I am delighted that such a man has gained the medal (cheers). He will find that by having won the gold medal his rams will produce a greater price than they did before; and thus he will have, as we have had, the advantage of an advertisement, without paying the Queen's duty (cheers, and a laugh). I beg again to thank you for the compliment you have paid me. So long as I have health you may depend upon it that I will never abandon the Smithfield Cattle Club, and that at all times the farmers of England may be assured that my efforts, humble as they may be, will be continued to promote the improvement of the cultivators of the soil, and their general welfare and prosperity (loud cheers). The noble duke then gave "The Vice-Presidents, and the health of the Earl of Hardwicke" (cheers).

The Earl of **Hardwicke** returned thanks. I am afraid, said the noble earl, that I am a better sailor than farmer; but at the same time I assure you that I take the deepest interest in everything connected with agriculture. Not only do I take an interest in it derived from the knowledge of the necessity of supporting it by every means in my power, and of sustaining it by example and exertion, for it is the base of the column on which rests the power of this country; but I feel and know that I should be wanting in my duty as a landed proprietor if I did not give some portion of my time towards studying and cultivating that important art, I suppose I must call it, now that we hear so much of the science necessary to carry on the operations of agriculture. (Hear.) I have been an exhibitor, and have had the good fortune to have a medal awarded to me. I thank the society for it, though I should have been better pleased had I received that medal more in conformity with my own views relative to the experimental fattening of cattle, than the system which is generally adopted in this country. The plan which I would adopt should be of a different character, though it is one more difficult, perhaps, to carry into operation. I consider that in bringing up animals to compete for a prize, the intention is to show that race and that breed which is the easiest to fatten; and that the present method does not show that at all. You do not really know how the animal has been fed, although it is stated so and so. You do not know how long it has been fattening; whether from infancy, for the previous six months, or any other period. You do not know its positive quality nor its age for a certainty. If you are to run a race of this description, it is my opinion that the animals to be fatted for exhibition should be inspected in their lean state, that their condition and breed should be made known, and that the fattening process should begin from the same date, and the animals be shown at the same period of time. You would thus early discover which has the best blood. At present, manage it as well as you can, I deny that the result is satisfactory, or that the contest is just or perfect. I admit that there are great difficulties to contend with, and that even by the present mode you have improved the breed and description of animal best fitted for the butcher. But it is doubtful whether you have given him an animal which is fatted at the quickest and cheapest rate; that, I think, can only be ascertained in the manner I have suggested. I know it becomes our duty at the present day to exert ourselves to the utmost, in order to obtain all the knowledge we can; and I willingly offer the tribute of my gratitude to Mr. Mechi (as well as other gentlemen) for the great exertions he is making to show us, if he can, how to manage the largest possible amount of produce at the cheapest possible rate (Hear, hear). But Mr. Mechi has not yet shown us his balance-sheet (loud cries of "Hear"), and until the time arrives that he does so, grateful as I am to him for his exertions, he has done nothing at all (cheers, and laughter). It may be perfectly true that he raises, as he says he does, 80 tons of mangold-wurtzel per acre (a laugh). It is monstrous to conceive the fact; but I have read that he has stated it. If I am wrong I shall be corrected. But it matters not if he had raised 90 tons an acre. I am certain it is practicable to do the thing. If he has done it, it can be done. But then it must be done at an enormous outlay of money; and not only of money, but of perseverance, anxiety, early watchfulness, and exertion (Hear, hear). The money is not laid out in the field alone, but upon the buildings and yards necessary to a system which is to carry to the land the finest manure that can be placed upon it. Then, after all this has been done—after he has expended his capital on the buildings, and laid out an enormous sum of money in labour, carting, and the other operations of agriculture—when he has sold his 80 tons of mangold, I want to see the balance-sheet (cheers and laughter). When we have ascertained the state of that, and when he has revealed to us, as I have no doubt he will, the mysteries of the great undertaking he is in process of performing, we shall be able to judge of the value of Mr. Mechi to the agricultural world (loud cheers and renewed laughter). If he has succeeded in it, and gives a large balance in favour of the farmer; if, whilst by his ingenuity and his trade in London he has improved the means of reaping the beards from the chins of the people, he has also succeeded in reaping an enormous quantity of grain, and can show us that he has done it with a profit, there is not a gold medal which will be large enough to reward him (cheers). But if, on the other hand, it turns out that farming has been a mere matter of amusement with him—an amusement in which he has sunk a large capital without realizing a profit—then we shall not award him a medal, though we will be grateful to him for having proved that most important point, the negative of the proposition (cheers). Gentlemen who carry on these operations are of the highest value to the country. Knowing as I do that the landowners and occupiers in carrying on their farming operations raise all their capital from the land itself, I would ask if anything should happen to break down the superstructure of the fabric, how would they be able to continue these operations in the way that Mr. Mechi has done? Drawing his capital altogether from other sources, he receives his capital with the one hand and bestows it with the other; but we at once receive and are obliged to bestow with the same hand (Hear, hear). I say, then, that they may talk to us as much as they please about applying more capital to the land and farming better; if there be a something which takes away the capital and the means of doing so, what rubbish it is to suppose that we can continue to carry on these operations! (cheers). We are now in such a position that the agriculturists are bound by every means in their power, and quickly too, to exert themselves and see if there are any means by which to keep the ship afloat (loud cheers). I want Mr. Mechi speedily to give in this balance-sheet of his; to give it to us before the year passes, that we may know what is the result of his operations (Hear). If he can show us that he is a great gainer, I for one will adopt his system; but until I see this important document, I cannot, from the circumstances of my own position—and I believe that they constitute the general position of the farmer—venture to undertake a thing of the result of which I am so doubtful (cheers). Everybody must be aware that by the outlay of money produce can be grown up to a certain quantity, and so corn will stand on end up to a certain weight; but beyond that weight it will not, for the straw would break, and the first rains destroy the crop. Now, though by a great outlay of capital on the land you might be able to produce such a crop that you would be obliged to train it as you do the vine for the purpose of supporting its head, the question comes, whether, after incurring that trouble and expense upon reaping and selling it the balance would not be against you (Hear)? The whole operation rests upon the results—the balance-sheet at the end of the year. It is altogether in vain to present us with notions of practical agriculture, unless you show us at every step the cost you incur, and the results in the markets of England (cheers). I agree that there is much to be done which is not of this merely experimental character, and that there is much which may be done with great advantage both by tenant and landlord; but as to telling me that the landlord of himself is to do it all, that is quite out of the question. It is morally impossible that the landlord of a great estate can carry on its operations, after having paid the charges upon the estate, and maintain the buildings and appurtenances to boot. I tell you it is a great stewardship. I know the tenantry of England take the right view of this point. What is the landlord to do, then? There is a variety of things admissible and permissible that are in constant operation every day. I have travelled from north to south within the last few weeks. I have visited many gentlemen and noblemen upon their estates. Now, no one single house did I enter, and not a gentleman did I wait upon, but the first and main topic of interest was the state of the agricultural population. He shows me what he is doing. He says, "Here are farms thrown up, but I have taken them in hand, and am draining them. Here is a tenant in want, and I am supplying him with tiles; and I have grubbed up the hedges and cut down the timber" (Hear). Throughout the country is that feeling predominant amongst the landlords—(Hear, hear)—and I believe that a greater degree of exertion is being made at this moment upon the land, by the joint powers of the landlord and the tenant united, than there has ever been at any period of our history (loud cheers). You will join with me in the prayer that those exertions may, in themselves, be full of that great and important result which I do trust in God, for the security of this country and its people, may be certain and effective (cheers). I trust that the agriculture of England may be sustained; for I do look with alarm, incalculable alarm, upon such a condition of the country as that wherein the fortunes and the wealth of the country are thrown upon the manufacturing interest alone. A more formidable, dangerous, and perilous position for a nation to be placed in, you cannot for a moment possibly conceive. Your exertions at this time are most important; for if by any accident, or the operation of any machinery, this great fabric is cut down, the trading and manufacturing population will not be able to support the interest and the honour of the nation against any foreign exigency (loud and protracted cheering). I hope I have not said a word that has trenched upon the society's rules. I have not touched upon any political topic. I have adverted solely to the cultivation of the land, and the happiness and prosperity of that numerous population which lives upon it, which is a fixed population and cannot be got rid of, for there it is (Hear, hear). I am sure you will agree with me in maintaining that agriculture is the first and great object of all who love the true interests of the empire. The noble Earl resumed his seat amidst general and protracted cheering.)

The Chairman gave "The Judges in the different Departments—Mr. Torr, Mr. Jonas Webb, and Mr. Buckley."

Mr. Torr responded, and alluding to the suggestion of the Earl of Hardwicke, with regard to the mode of conducting competition for prizes, said that it was altogether impracticable, on account of the numerous difficulties which would have to be encountered in attempting to act upon it.

The Chairman proposed "The Health of Mr. Brandreth Gibbs, the Honorary Secretary," in highly eulogistic terms; but not more so than all who have occasion to come in contact with that gentleman will promptly allow him to be most justly entitled to.

The toast was drunk with three times three.

Mr. Gibbs returned thanks.

The next toast was "The Butchers, and the Health of Mr. Waite," who had gained the silver medal as the purchaser of the largest quantity of stock at this year's show.

The Chairman said that when his noble friend, the Earl of Hardwicke, spoke of Mr. Mechi growing 80 tons of mangold wurtzel upon one acre of land, that was not exactly the case. He (the Duke of Richmond) believed that, in some market garden, they had planted somewhere about the breadth of the table.

Mr. Mechi.—About four acres and a half.

The Chairman.—Mr. Mechi said four acres and a half; and they had got in that market garden, which he believed was at Battersea, 80 tons per acre; but Mr. Mechi would be very sorry to have it supposed that he, as a farmer, had ever grown that quantity. He (the Duke of Richmond) was sure that if he attempted it, and a prize was offered for it, Mr. Mechi would be unable to do it, and would be an unsuccessful competitor (laughter). The balance-sheet would not enable him to do it (renewed laughter). The noble duke then gave, "The Health of the Unsuccessful Competitors."

Mr. Chamberlain returned thanks; and after drinking "Success to the Trade, Commerce, and Manufactures of the Country," the assembly broke up.

The following is a list of prizes awarded—

Oxen or Steers.

Class 1.—The first prize of 30 sovs. for a Devon ox to Mr. John Tucker, of Staplegrove, near Taunton—a silver medal to the breeder, Mr. John Priscott, of Staplegrove; the second prize of 15 sovs. for a Hereford ox to Mr. Joseph Phillips, of Ardington, near Wantage; the third prize of 5 sovs. for a Hereford ox to his Grace the Duke of Richmond, of Goodwood, near Chichester.

Class 2.—The first prize of 30 sovs. for a Durham ox to the Right Hon. the Earl of Hardwicke, of Wimpole, near Cambridge, and a silver medal as the breeder; the second prize of 15 sovs. for a Durham steer to Mr. Henry Frampton, of

Faringdon-road, Faringdon; the third prize of £5 for a short horned steer to the Marquis of Northampton, of Castle Ashby, Northampton.

Class 3.—The first prize of £25 for a Hereford ox to Mr. William Heath, of Ludham, near Norwich—a silver medal to the breeder, Mr. J. Bill, of Whiteway Head, Ludlow, Salop; the second prize of £15 for a short horned steer to Mr. J. S. Bult, of Dodhill, Kingston, Taunton; the third prize of £5 for a short horned ox to Mr. James Clover, of Creeting St. Mary, Needham Market.

Class 4.—The first prize of £20 for a Hereford ox to his Royal Highness Prince Albert—a silver medal to the breeder, Mr. Thomas Sheriff, of Buckton, near Ludlow, Hereford; the second prize of £10 for a short horned steer to Mr. J. S. Bult, of Dodhill, Kingston, Taunton.

Class 5.—The first prize of £15 for a North Devon ox to the Right Hon. the Earl of Aylesford, of Packington, Coventry, and a silver medal as the breeder; the second prize of £5 for a Devon steer to Mr. Thomas Bond, of Bishop's Lydeard, Taunton.

Class 6.—The prize of £10 for a Galloway Scotch ox to Mr William Heath, of Ludham, near Norwich.

Cows or Heifers.

Class 7.—The first prize of £20 for a short horned heifer to the Right Hon. Lord Feversham, of Duncombe-park, Helmsley, and a silver medal as the breeder; the second prize of £10 for a short horned heifer to Mr. Stephen Gooch, of Honingham, near Norwich; the third prize of £5 to his Royal Highness Prince Albert.

Class 8.—The first prize of £20 for a short horned cow to Mr. Stephen Gooch, of Honingham, near Norwich—a silver medal to the breeder, Mr. Nath. Cartwright, of Haugham, near Louth; the second prize of £10 for a short horned cow to Mr. J. H. Gurney of Easton, near Norwich.

Class 9.—The first prize of £20 for a Durham cow to Mr. Thomas Aveling, of March, Isle of Ely, Cambridge, and a silver medal as the breeder; the second prize of £10 for a short horned cow to Mr. William Woodward, of Breedon's Norton, near Tewkesbury.

Long-woolled Sheep.

Class 10.—The first prize of £20 to Mr. G. S. Foljambe, of Osberton-hall, Worksop, and a silver medal as the breeder; the second prize of £10 to the Most Hon. the Marquis of Exeter, of Burghley-house, Stamford; the third prize of £5 to Mr. J. S. Cranfield, of Harrowden, Bedford.

Class 11.—The first prize of £20 to the Most Hon. the Marquis of Exeter, of Burghley-house, Stamford, and a silver medal as the breeder; the second prize of £10 to Mr. Thos. Twitchell, of Wilington, near Bedford; the third prize of £5 to Mr. Richard Newman, of Harrowden, near Bedford.

Long-woolled Sheep (not being Leicesters).

Class 12.—The prize of £10 to Mr. Robert Beman, Moreton-in-Marsh, Gloucester, and a silver medal as the breeder.

Cross-bred.

Class 13.—The first prize of £10 to Mr. J. R. Overman, of Burnham Sutton, near Burnham Market, and a silver medal as the breeder; the second prize of £5 to Mr. John Hitchman, of Little Milton, near Wheatley, Oxon.

Class 14.—The prize of £10 to Mr. J. R. Overman, of Burnham Sutton, Burnham Market, and a silver medal as the breeder.

Short-woolled Sheep.

Class 15.—The first prize of £20 to Mr. John Williams, of Buckland, near Farringdon, and a silver medal as the breeder; the second prize of £10 to his Grace the Duke of Richmond.

Class 16.—The prize of £10 to his Grace the Duke of Richmond, and a silver medal as the breeder.

Class 17.—The first prize of £20 to Mr. J. V. Shelley, of Maresfield-park, Sussex, and a silver medal as the breeder; the second prize of £10 to his Grace the Duke of Richmond.

Pigs.

Class 19.—The first prize of £10 to Mr. William Fisher Hobbs, of Boxted Lodge, near Colchester, and a silver medal as the breeder; the second prize of £5 to Mr. W. M. Barber, of Langley Broom, near Slough.

Class 20.—The first prize of £10 to Mr. John Coate, of Hammoon, near Blandford, and a silver medal as the breeder; the second prize of £5 to his Royal Highness Prince Albert.

Class 21.—The prize of £5 to the Right Hon. the Earl of Radnor, of Coleshill, near Farringdon, and a silver medal as the breeder.

Gold Medals.

The gold medal for the best ox or steer in classes 1, 2, 3, 4 5, and 6, to Mr. William Heath for his Hereford ox.

The gold medal for the best cow or heifer in Classes 7, 8, 9, to Mr. Stephen Gooch for his Durham cow.

The gold medal for the best pen of long-woolled sheep in Classes 10, 11, and 12, to Mr. G. S. Foljambe.

The gold medal for the best pen of short-woolled sheep in Classes 15, 16, and 18, to Mr. John Williams.

The gold medal for the best pen of pigs in Classes 19, 20, and 21, to Mr. John Coate.

Extra Stock.

The silver medal for the best beast in extra stock to Mr. Stephen Gooch.

The silver medal for the best long-woolled sheep in extra stock to the most Hon. the Marquis of Exeter.

The silver medal for the best short-woolled sheep in extra stock to his Grace the Duke of Richmond.

The silver medal for the best cross-bred sheep in extra stock to Mr. John Hitchman.

The silver medal for the best pig in extra stock to Mr. W. M. Barber.

Commendations.

Class 2.—The judges highly commend Mr. R. Stratton's ox.
Class 5.—Commend the Earl of Leicester's steer.
Class 6.—Commend Mr. John Rob's ox.

Extra Stock Cattle.

Commend Messrs. John and James Martin's ox.

Extra Stock—Cross-bred Sheep.

Commend Mr. J. R. Overman's sheep.
Class 15.—Highly commend Mr. Sainsbury's sheep.
Class 16.—Commend Mr. Shelley's sheep.
Class 17.—Highly commend the Earl of Chichester's sheep.

Extra Stock—Short-wools.

Commend Mr. Sainsbury's sheep; also Mr. John Williams sheep.
Class 19.—Highly commend Mr. Barnard's pigs.
Class 20.—Highly commend Mr. Rawlence's pigs.
Class 21.—Commend Mr. S. Druce, jun.'s pigs.
Commend Mr. W. Wood's pigs.

Extra Stock—Pigs.

Commend Mr. Coates's pigs.
Commend Sir John Conroy's pigs.
Commend Mr. W. Fisher Hobbs' Pigs.

Judges of Cattle and Long-woolled Sheep.—Messrs. Thomas Reynolds, Ralph Oldacre, and Samuel Wiley.

Judges of Cross-bred Sheep, Short-wools, and Pigs.—Messrs. Henry Lugar, Henry Fookes, and Arnold Denman.

EXHIBITION OF AGRICULTURAL PRODUCE, SEEDS, &c.

There was a most interesting display of agricultural produce on the stand of Messrs. Thomas Gibbs and Co., of Half-Moon-street, Piccadilly, the seedsmen of the Royal Agricultural Society of England. The specimens of mangold wurtzels were of a very superior description, as was also their green-topped yellow globe turnip: the purple Kohl rabi, as well as the green, was also of very fine quality. They showed some very large specimens of cattle parsnip, which is a most nutritive root, well adapted to vegetable soils, deep moulds, and damper soils than carrots affect. They had also specimens of the different varieties of the permanent grasses adapted to agricultural purposes. Their specimens of wheat, barley, and oats were also very extensive. On each day this stand attracted much attention. The stand of Mr. W. Skirving, of Liverpool, likewise contained some splendid specimens of turnips, mangold wurtzel, carrots, cabbages, Kohl rabi, &c., &c. The Swedish turnips were much admired: they are described as giving a more sound bulb than other varieties with the same culture, and exhausts the land less. On the stand of George Gibbs and Co., of Down-street, Piccadilly, were some very fine specimens of the Ashcroft swede, as well as several descriptions of other Swedish and hybrid turnips and mangold wurtzel. They also exhibited various specimens of agricultural seeds. The specimen exhibited by Mr. J. Rivers, of Sawbridgeworth, of the stubble Swede turnip, was particularly noticed: it is a cross between the early stone and the old green-top swede. The specimens exhibited were from five distinct sowings: those sown the 20th May averaged 10lbs. 7 oz. each. Mr. Frederick Chatwin, of Plumstead, near Woolwich, exhibited specimens of the Silesian sugar beet, an improved description of mangold wurtzel, and described as superior feeding for milch cows. The early champion kidney potato was also much admired. On the whole the several specimens exhibited by seedsmen were most attractive, from their size and beauty.

SMITHFIELD GREAT CHRISTMAS CATTLE MARKET.

Monday, Dec. 16.

The rapid increase observed of late years in the consumption of meat in the metropolis, and the splendid show of stock brought together for competition in Baker-street last week, under the auspices of the Club, induced the opinion that a very superior supply of Beasts, fit for Christmas consumption, would be exhibited here to-day. Public expectation was therefore on the "tip-toe;" and we may add—as will be apparent from the following remarks—that it was in no way disappointed. Large numbers of Beasts, brought in "monster" trains, reached London on Saturday by the Great Western, North Western, Eastern Counties, and the Great Northern Railways, the total number conveyed upon those lines being upwards of *four thousand head*, exclusive of nearly 15,000 sheep! Such was the demand for cattle trucks, that it was found impossible to bring up the whole of the stock till a late hour last evening. The lairage at Islington and elsewhere was fully occupied yesterday, and in some instances it was found necessary to employ a large number of additional hands to keep the cattle together in regular order, and prevent confusion and loss.

The arrangements made by the authorities to give space to the stock were generally satisfactory, although of course the area of the market could not accommodate the whole of the Beasts — notwithstanding that they were "packed" together as densely as possible—shown by the various salesmen, many of whom were graziers and breeders, especially as relates to those from the west of England, who were chiefly stationed in Giltspur-street and adjacent turnings, which were completely full of Devons, Herefords, &c., forming a strange, but pleasing contrast to the "party colours," of which glimpses were obtained from other directions. To give something like an idea of the extraordinary composition of the Bullock supply, we may state that Devonshire forwarded its full average number of pure-red Devons; Herefordshire claimed, and justly obtained, its usual numerical position with its wonderful "white-faced and red-sided" pure Herefords. Lincolnshire, Leicestershire, and Northamptonshire contributed their thousands of mottled short-horns, besides their "improved" stock, chiefly white; Norfolk, Suffolk, Essex, and Cambridgeshire provided a rich treat for future banquets, in the shape of their well-known table Scots, not omitting a few remarkably fine home-breds; Sussex was not behind in the race, and her stately oxen—scarcely any of which were under seven years old—commanded great attention. Northumberland, Cumberland, Westmoreland, Warwickshire, Staffordshire, Shropshire, Rutlandshire, and most other parts of England, were represented by stock which reflected the greatest credit upon the grazing community, and which, we need scarcely say struck the vast crowd in attendance—amongst which were hundreds of foreigners—with astonishment. In the general condition of the foreign breeds no marked improvement was perceptible. The competition—and consequently the reduction in the charges for conveying stock by the great lines of railway, such, for instance, as the northern companies—brought us an extraordinary show from Scotland; indeed, it may be considered the best on record. Scots were exhibited which had travelled by rail upwards of five-hundred miles; there being supplies of them from Aberdeen, Fifeshire, and other counties. By sea, the number was somewhat limited, owing to the loss and damage frequently sustained by heavy stock on board the steamers.

A mere glance at the collection of cattle here, this morning, shows the desirableness—nay, the necessity—of a change in the exhibition-rules of the Smithfield Club; and it is satisfactory to be enabled to observe that it is in contemplation to form classes for each distinct breed, and thereby abolishing the present mode of competition, which is chiefly based upon early maturity. Stock was shown which would—under a new order of things—have done infinite credit to the "yard;" and it cannot be concealed that such an addition to it would have greatly increased its usefulness and extent. If early fattening is to be taken as the true test of the value of any particular breed—of which we entertain great doubts, that is to say if aggregate profits are to be considered in the general expenditure—we could have pointed out large numbers of Devons, Herefords, and runts, which exceeded 150 stones (8lbs.) in weight, which were under four years old. In other instances, there were Oxen from seven to eight years old, which were fully 180 stones in weight. This is, however, a point which we shall not pursue further at present. It must be sufficient for us to observe that a more wonderful collection was never witnessed in this great metropolis. The unusually low prices obtained here during the whole of the present year, and the increased imports from abroad, might have led many parties to anticipate a falling off in the supply; but the fact is—and the immense arrivals of dead meat up to Newgate and Leadenhall fully supports the statement—the numbers of both Beasts and Sheep in almost every district in England, including Scotland, are still rapidly increasing. The absence of any serious epidemic, the favourable state of the weather during the summer months (and which produced an immense supply of food, which is still selling at remarkably low figures), together with the large return of the root-crops, have enabled most of the graziers—especially as lean stock was purchased at reasonable currencies in the early part of the season—to speculate upon increased supplies, notwithstanding that the returns are anything but remunerative. Under such circumstances, a decline in the supply could scarcely have been expected by practical men.

We shall now proceed more particularly to analyze the show of Beasts. From the numerical strength of that from the northern counties, it may be readily conceived that the Shorthorns ought to claim our first attention; and it is but just to their owners to state that, number and general weight considered, the supply in this respect stood first. Next to these we class the Herefords; whilst the Devons, runts, and Sussex stock steadily brought up the rear. Of course, we are here considering the English breeds only, as it would be manifestly unfair to throw aside the produce of Scotland as occupying even a second rank.

From distant parts of the country numerous buyers were in attendance, and many of the best Shorthorns, Herefords, Scots, Devons, &c., were purchased by them for conveyance to Brighton, Plymouth, Bristol, Bath, Liverpool, Birmingham, Hull, Norwich, and to within any easy distance of London, at prices which will be found in detail below.

The following statement shows the number of Beasts exhibited, and the prices obtained for them, on the "great days" during the past eleven years:—

Year.	Beasts shown.	Prices.
1839	5,074	3s. 4d. to 5s. 0d.
1840	3,528	4s. 4d. to 5s. 8d.
1841	4,500	3s. 8d. to 5s. 0d.
1842	4,541	3s. 4d. to 4s. 8d.
1843	4,510	2s. 8d. to 4s. 4d.
1844	5,713	3s. 0d. to 4s. 6d.
1845	5,326	3s. 6d. to 4s. 8d.
1846	5,470	3s. 6d. to 4s. 6d.
1847	4,282	4s. 0d. to 5s. 8d.
1848	5,942	3s. 4d. to 4s. 8d.
1849	5,765	3s. 4d. to 4s. 6d.

It may be necesssary for us to observe—as statements of a very inaccurate tendency have appeared of late in some journals of the supplies shown at this particular period of the year—that the above numbers of Stock have been from time to time furnished by the clerk of the market.

Although the season is now far advanced, the imports of foreign Stock into London last week were very extensive. The total supply amounted to not less than 5,734 head. During the corresponding period in 1849, we received 3,720; in 1848, 1,848; and in 1847, 1,913 head.

IMPORTS INTO LONDON LAST WEEK.

From Whence.	Beasts.	Sheep.	Calves.	Pigs.
Rotterdam	391	1290	313	18
Antwerp	—	—	33	—
Ostend	—	—	6	—
Dordt	76	228	13	—
Harlingen	161	1698	4	5
Nieu Diep	21	512	—	10
Tonningen	196	10	—	—
Amsterdam	14	725	—	—
Total	859	4473	369	33
Corresponding week in 1849	533	2937	239	11
Same week in 1848	625	2432	96	2
Same week in 1847	258	1584	71	—

Very few arrivals have been reported at the outports.

By sea from Ireland, 7 Beasts and 71 Pigs arrived for this market last week.

Amongst the Lincolnshire Beasts exhibited to-day, we noticed several wonderful Short-horns bred by Mr. Wm. Goodall, of Deeping; Mr. Wm. Thomas, of Holbeach; Mr. Robert Cook, of Portland; Mr. Hewson, of Newborough; and Mr. Dunn, of Spilsby: whilst the principal portions of the Scots were forwarded by Messrs. Martin, Mr. Thomas Knowles, Mr. George Knowles, Mr. Milne, Mr. J. Cooper, Mr. J. Keith, and Messrs. Stoddart, the well-known Scotch breeders. From Aberdeenshire, some splendid Oxen were sent by Mr. Felton, as well as by Mr. Robert Leeds, and others from Norfolk. The above is strictly in reference to the space occupied by Messrs. Vorley and Morgan, and we need scarcely intimate that their stands commanded very general attention.

Mr. Thomas Dixon, of Islington—to whom a large portion of the Marquis of Exeter's stock is generally consigned—had a very extraordinary show of stock—that gentleman having on offer 28 Oxen, the property of Mr. John Little and Mr. John Wadlow, of Whittlesea, Isle of Ely; and 5 bred by Mr. Jesse Walsham. Most of them were of great weight and splendid symmetry.

Mr. Collins had consigned to him 10 remarkably fine North Devons from the estate of Mr. Hudson, of Castleacre, Norfolk. The whole of them had been worked two years, and their average weight was computed at 40 stones per quarter.

Mr. Maidwell, and most of the other salesmen, had collections of stock which reflected the highest credit upon their owners.

Having pointed out what we conceive to be the finest specimens of Beasts in the market, we shall now refer to the Sheep. At least three-fourths of them were above the middle quality; indeed, scarcely any inferior animals were amongst the supply. The Leicesters and Lincolns especially were of unusual weight.

In the pens occupied by the stock of Messrs. Whitbread and Starky, were ten remarkably good ewes belonging to Mr. M. T. Hodding, of Salisbury, and which had obtained prizes at two provincial shows. The Sheep were greatly admired.

Messrs. Weall, the well-known salesmen, had a show of Sheep which would have done infinite credit to the Baker Street exhibition, viz., 52 unusually large Downs, bred and fed by E. F. Whitingstall, Esq., of Langley-Bury, Watford, Herts, which sold at £5 each; 7 Gloucesters, by R. Rowland, Esq., of Creslow, Aylesbury, Bucks, which realized £6 each; and 84 ewes, the property of Mr. Rowland. Messrs. Weall had also 40 fine Downs, forwarded by Harding, of Oxfordshire, and several lots from various other graziers.

STATE OF THE TRADE.

Although, as we have already observed, the attendance of butchers from all quarters was numerous, the overwhelming nature of the Bullock supply, together with the unfavourable state of the weather for slaughtering, and the immense quantities of meat in Newgate and Leadenhall markets, produced a state of trade without a parallel. From the opening of the market till nearly 8 o'clock scarcely any sales took place; and throughout the day the demand for all breeds of Beasts ruled excessively heavy, at unusually low prices. This must be obvious when we state that even the finest animals in the collection did not realise more, on the average, than 3s. 10d. per 8lbs. A few of the Aberdeen Scots might have produced 4s. per 8lbs.; but this must be considered as a very extreme point. At the close of the market there could not have been less than *two thousand Beasts unsold.*

For the time of year the number of Sheep was good. Compared with that for Beasts the demand was steady; nevertheless it must be called very inactive, at last week's prices. The top prices for the best old Downs were 4s. to 4s. 2d. per 8lbs.

There were about 60 Dorset Lambs in the market, in fair condition.

AGRICULTURE AND THE RURAL POPULATION ABROAD.

DENMARK.—No. I.—ITS AGRICULTURAL EXPORTS.

(FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.)

Amongst the countries from which England derives the most abundant of those foreign supplies of provisions with which the experience of late years has shown that she cannot dispense, the Danish dominions occupy a far higher rank than would be imagined possible by one who merely looked to their relative size and importance in the catalogue of European states. The kingdom of Denmark and its dependencies stand in this respect third in order, there being but two countries from which we import a larger quantity of breadstuffs. Whilst America last year sent us, as appears by the Parliamentary Return, 1,834,000 quarters of grain and meal of all sorts, and Prussia 1,364,694 quarters—from Denmark Proper, a country whose area is not one-fiftieth of the United States, and hardly one-fifth of Prussia, we received the proportionally enormous amount of 1,320,571 quarters. The agricultural relations and and capabilities of the Danish State form, therefore, a subject which no native of the British Islands can view with indifference. It will be interesting to ascertain the various causes which enable so inconsiderable a kingdom to spare us so vast a quantity of the articles which form the first necessary of life, and to know whether any political or other accidental circumstances have had any share in contributing to this result. The social condition and character of the Danes—a people so little known to us in modern times, yet so closely connected with us by ancient recollections as well as by affinities of blood and language, and presenting in their whole history and in the circumstances of their national life, nay, in the geographical conformation and position of the land they live in, a closer analogy to ourselves than any other European people—also offer, as will be perceived, many interesting points of investigation, having a direct and obvious bearing on the important questions involved in the present inquiry.

Nothing can better show the utility, nay, the necessity, of such an inquiry as the present, than a reference to the account of Danish agriculture drawn up for the British Government by the late Mr. Jacob, some twenty years back. He describes a condition of things such as existed in the last century, and which continued, no doubt, without material variation down to his own time. The multifarious changes and improvements which the present age has introduced in legislation, in the useful arts, and in national customs and habits, had not then had time to exert their influence in this remote quarter of Europe; social relations and usages were such as prevailed under the feudal system; and the state of agriculture was so backward as to lead him to the conclusion that, "as far as concerned the trade in corn with Great Britain, the division of Denmark Proper could have very little influence." It will be my duty to describe a state of things essentially different from that which Mr. Jacob found subsisting. As regards his closing position, the mere enunciation of the fact referred to in the opening sentences of this letter is sufficient to prove its fallacy. But the development of the agriculture and corn trade of Denmark has been so rapid and striking of late years, that a few illustrations of the contrast between their present and former condition, deduced from official returns, will not be out of place as preparatory to more minute details.

The returns of the Danish Government state the entire export of corn, of all sorts, for the year 1820, at 546,387 quarters, reducing Danish measures to English; and for the year 1826, at 787,946 quarters. In the year 1846, on the other hand, the net exports of grain and meal from the entire Danish monarchy amounted to 1,383,014 quarters; and in 1847 (the last year for which the returns are complete), to 1,310,000 quarters—showing an increase of not much less than double since 1826, and of considerably more than double since 1820. The confusion occasioned by the Schleswig-Holstein war, which deprived the Danish Government of a large portion of its revenue, and also of its customs accounts and export and import lists, has prevented the publication of any official statement as to the export of the Duchies subsequently to the year 1847; but if we exclude those provinces, and confine our attention to the territory of Denmark Proper, the increase in the exports of corn will appear not less remarkable. In the year 1820, the exports of grain from Denmark Proper, to all parts of the world, were only 270,477 quarters; and in 1826, 406,020 quarters. In 1846 the exports from Denmark Proper were 1,076,756 quarters; in 1847, 859,682 quarters; and in 1848 they reach the total of 1,365,970 quarters, being five times the amount of the exports of 1820, and more than three times that of 1826.

The area of Denmark, including the provinces of Schleswig, Holstein, and Lauenburg, is about 25,000 English square miles (not equal, therefore, to that of Scotland), with a population of 2,239,077 (nearly 90 to the square mile), according to the census of 1845. Possessing no mines of any kind, and having been debarred by nature and circumstances from either the means or the opportunity of extensive commerce and varied manufactures, it is essentially an agricultural country, and its inhabitants find their main source of employment in the tillage of the soil. Although the Danes have always been regarded as holding a distinguished rank as a maritime people, their naval enterprize has been directed rather to military than commercial ends; and their statisticians calculate that whilst the cultivators of the earth form 50 per cent. of the population, the seamen and fishermen do not number more than 30 in every thousand. The insular position of Denmark and its numerous harbours afford, however, facilities for commerce, though the materials may be scanty; and the seas which everywhere separate or intersect its territory, now traversed in all directions by steam vessels, present a ready means of communication between the different districts. The country may be regarded as forming the northern termination of that great European level which is so remarkable a feature in the conformation of the continent—embracing a large portion of Germany and the Netherlands, resting on the Wezer and Hartz mountains in the south, and stretching in a westerly and easterly direction—from the North Sea and the English Channel till it joins the vast plains of Poland and Russia. This level prolongs itself on the north into the peninsula of Jutland, separating the North Sea from the Baltic. Between the latter and that great bight of the North Sea which is called the Cattegat, lie the principal Danish Islands. Their situation and shape are such as to make it probable, if not certain, that at a remote period of the world's history they formed a single tract, conjointly with the opposite coasts of Jutland and Sweden, through which the sea, in the course of ages, broke out the various channels that surround them. The surface of Denmark is undulating and varied, with no remarkable elevations—the highest of its hills being the Himmelberg in Jutland, which has an altitude of no more than 550 feet. The soil is a sand, or sandy clay, in the more fertile parts, resting on chalk formations, which sometimes even appear on the surface, and which supply the husbandman with marl and lime in abundance. Mosses and bogs occupy a very considerable part of the area of Denmark, which, however, are so far useful as furnishing to the inhabitants, in their peat, an inexhaustible stock of the most economical, and, for domestic purposes, probably the most convenient fuel.

The proportion which the various descriptions of soil, making up the whole area of Denmark, bear to each other, is as follows:—

Tilled and pasture land	16,375 square miles.
Heath and shifting sand	4,400
Mosses and bog meadow	1,775
Woods	1,175
Townships, roads, fences, dykes, &c.	975
Lakes	350
	25,050

The relative extent of land under tillage in Denmark Proper alone (no accurate details exist as to the Duchies) will be more clearly appreciated by the help of the following tables, showing the proportion of sown to unsown land, which I extract from the elaborate and admirable work on the National Economy of Denmark, published by Professor Bergsoe, of Copenhagen, the head of the Statistical Department of the Danish Government, to whom I am indebted for the kindest assistance in the prosecution of my inquiries. The sown is to the unsown land, excluding the area of the towns:—

In Denmark Proper	as	1	is to	4·15
In Zealand	„	1	„	2·82
In Moen	„	1	„	2·67
In Bornholm	„	1	„	3·54
In Fyen	„	1	„	2·70
In Langeland	„	1	„	2·52
In Lolland	„	1	„	3·09
In Falster	„	1	„	2·54
In Jutland	„	1	„	5·50
COUNTY OR PREFECTURE.				
(Amt) of Hjærring	„	1	„	6·24
„ Aalborg	„	1	„	5·22
„ Thisted	„	1	„	4·25
„ Viborg	„	1	„	4·73
„ Randers	„	1	„	3·80
„ Aarhus	„	1	„	2·55
„ Skanderborg	„	1	„	5·04
„ Veile	„	1	„	4·55
„ Ringkjœbing	„	1	„	11·05
„ Ribe	„	1	„	8·65

As to the comparative fertility of the various provinces or districts of Denmark, though every variety of sandy or clayey soil is to be found in most of them, it may be stated here generally that the islands of Fyen, Langeland, Falster, and Lolland, in all of which clay predominates, are considered the most fruitful. Zealand comes next, and Jutland contains the greatest proportion of unprofitable and unimproveable land; the arable soil being to the waste or useless as 1·25 is to 1. Fyen, with Langeland and other smaller islands adjacent, contains an area of 1,450 English square miles; Lolland and Falster, of 725; and Zealand, of 3,150. Lolland grows a larger proportion of wheat than any other district; it is a flat island, so low as to be almost level with the sea—especially its south-western division, where the meadows on the coast are subject to periodical overflows, and are hence called by the country people *saltnings*—and having a strong heavy clay soil. In spite of the difficulty of draining off the moisture, occasioned by the lowness of the island's surface, it is considered one of the most fruitful portions of Denmark. But as regards the relative fertility of the different provinces, general observations convey no very definite idea to the reader; whilst to pursue the subject into minute topographical detail would be tedious and uninteresting. Abundant illustrations of it will, however, present themselves in the course of these letters. The Danes have a method, both clear and compendious, of expressing relative fertility, to which I am not aware that anything similar exists in any other European country. The term *hartkorn* —originally a certain quantity of corn, paid to the government off every state by the proprietor—now designates not the land-tax itself, but its basis; that is, it expresses the value of a certain portion of land, as resulting both from extent and quality. A ton of *hartkorn* is thus a fictitious quantity, for the determination of which more or less land is required, according as the ground is good or otherwise. With barren soil there may be 50 or 100, or more acres (*tönder*) of land to one ton of *hartkorn*; with very fruitful land, four or five acres would be rated at one ton of *hartkorn;* with land of fair average quality, ten acres. Thus, when the absolute extent of land and the amount of *hartkorn* at which it is rated are known, the relative quality and value of the land are at once ascertained.

The climate of the Danish islands resembles, to a great extent, that of England. In summer the weather is steadier, and the sun generally more powerful; the winters are generally more rigorous, the mean degree of cold being 0·4 of the centigrade thermometer. Sometimes, however, they are comparatively mild, for the climate partakes of the same insular fickleness as our own. The spring and autumn much resemble those of England. Excellent figs ripen in the open air on the garden-walls, and in the end of September I noticed violets in bloom. In winter navigation is stopped, as the Baltic is hampered with blocks of ice, and its waters, owing to their shallowness, are generally frozen over near the shore. On the German coast of the mainland, the cold is much more severe than in the Danish islands, though it lies farther to the south. Walnut trees are killed by the winter's cold in Prussia and Mecklenburg; and vines sustain less injury from the open air in the Danish islands during winter than they do in the northernmost vine districts of the continent. Thus, whilst Denmark has no such winter's cold as to prevent the thriving of many trees and plants, its summers are so warm as to allow various plants to come to maturity, which, from want of sun-heat, will not ripen in many places where the mean temperature of the year is higher. In Edinburgh, which lies nearly in the same degree of latitude as Copenhagen the mean temperature of the year is 7·11 of the centigrade thermometer, whilst in Copenhagen it is but 6·58. The average temperature of winter is also three degrees higher in Edinburgh than in Copenhagen; yet excellent peaches ripen without artificial warmth in Denmark—whilst in Scotland, and even in England, from the low temperature of summer, they only ripen in hothouses or on walls. Another favourable feature of the Danish climate is the moderate amount of rain which falls during the year. With a mean temperature of 6½ degrees (Reaumur), the depth of rain that falls is 20 inches. Were the climate of Denmark as wet as that of Bergen, where the depth of rain that falls during the year is 80 inches, its clay lands would be rendered useless; or were it as dry as that of Upsala, where the depth of rain in a year is only 14 inches, the productive capacity of its sandy soils would be materially impaired. The month of March being (as with us) the least rainy, the ground is in the state best adapted for the operation of ploughing, and the greatest quantity of rain falls from May to October, when its effect on the grass, seed, and root-crops, is most propitious.

Copenhagen is the only great city of Denmark; its population, by the census of February, 1845, was 126,787. The small proportion which the population of the towns bears to that of the country will be perceived from the following table:—

	Town Population.	Country Population.	Proportion of Town to Country Population
Zealand (deducting Copenhagen) ..	33,627	296,734	as 113 to 1,000
Moen	1,623	10,674	... 152 ... 1,000
Fyen	24,611	133,671	... 184 ... 1,000
Langeland	1,770	14,199	... 125 ... 1,000
Lolland	6,665	43,782	... 152 ... 1,000
Falster..........	2,770	18,185	... 152 ... 1,000
Jutland	59,878	488,820	... 122 ... 1,000
Denmark Proper (excepting Copenhagen) ..	260,062	1,022,965	.. 254 .. 1,000

I have already alluded to the great amount of the supply of breadstuffs which we receive from Denmark, as signally exemplifying the rapid progress and present activity of its agriculture. For the elucidation of this subject, however, it is of equal or greater importance to look at its exports of cattle and other products of husbandry, whether destined for the food of man or for the raw material of manufactures. The following tables show the amount of the exports of cattle from Denmark (with the computed value in English money) for the years 1841-7. The first column shows the average amount of the exports for the five years 1836-40:—

	Ave. of 1836--40.	1841.	1842.	1843.	1844.
Horses	9981	10325	8926	11258	13423
Oxen	35253	26387	27635	37341	41316
Cows		6597	6909		
Calves........	8567	13344	12101	13385	13883
Swine........	13858	19877	18677	20718	17360
Sheep & lambs	15888	15701	18405	19017	17423

	1845.	1846.	1847.	
Horses	14339	12168	11250	at 11*l*. 2s. 6d. the head, 125,156*l*.
Oxen and cows	40091	40474	44084	at 3*l*. 5s. to 7*l*. 10s. the head, about 280,000*l*
Calves........	14951	13986	15186	at 15s. the head, 11,389*l*.
Swine........	23600	28629	15749	at 22s. 6d. the head, 18,842*l*.
Sheep & lambs	17659	18195	23603	at 7s. 6d. the head, 8,851*l*.

The great bulk of the cattle exported has been from the Duchies of Schleswig and Holstein. In 1848 the exports from Denmark Proper amounted only to 735 horses and 897 oxen. The partial attempts hitherto made to open up a direct cattle trade with England from some parts of Jutland have had no great success, owing to the deplorable circumstances of the last two years; but Denmark possesses stock sufficient for a large export, as I shall show in the proper place.

Butter is perhaps the most important of all articles which appear in the list of Danish exports. In 1830 the exports of this article amounted to 114,584 cwts. (51,563 Danish *tönder*); in 1840, to 164,513 cwts. (74,031 *tönder*); in 1847, to 183,790 cwts. (82,755 *tönder*); showing a very rapid rate of increase. Three-fourths of the exports of butter are from the Duchies, and of this again 6-7ths fall to the share of Holstein; indeed, in the last year for which the returns are complete, the proportion was even more considerable, Holstein having furnished 61,218 *tönder* out of the whole export of 82,755. In 1848, the export of butter from Denmark Proper amounted to 23,342 cwts. (10,513 *tönder*). The export of butter has been trebled since the commencement of the century, and doubled in 20 years. The exports of cheese in 1847 were 8,770 cwts., of which 5,112 were from Holstein. Not less remarkable is the increase in the exports of flesh and pork. In 1831 these amounted to 7,060 cwts. of flesh, and 18,150 of pork; in 1840, to 36,194 cwts. of flesh, and 63,670 of pork; in 1847, to 21,914 cwts. of flesh, and 38,235 of pork. In 1848, the exports from Denmark Proper alone were 9,993 cwts. of flesh, and 9,398 cwts. of pork.

The exports of wool from Denmark were 10,849 cwts. in 1840, 19,906 cwts. in 1844, and 23,951 cwts. in 1847. The exports of wool in 1848 from Denmark Proper alone were 18,065 cwts. This shows a very remarkable increase in this article within the last ten years, the exports having remained stationary for a long time up to 1840.

The exports of skins and hides were 27,307 cwts. in 1840, and 14,723 in 1847. The falling off in this branch is ascribed to the establishment of new tanneries, and to the consequent increase of domestic consumption.

The export of oil-cakes averaged 101,237 cwts. in five years up to 1840; in the latter year it reached 170,000 cwts.; in 1844 it was 210,000 cwts.; and in 1847, 208,519 cwts. The great bulk of this article is exported from the Duchies (and chiefly from the port of Flensburg), the share of Denmark Proper being only one-twelfth. Almost the whole export goes to England.

The exports of flax and hemp seem also to be increasing of late years, though the quantity is but inconsiderable. In 1845 they amounted to 207,625 lbs.; in 1847, to 215,674 lbs.; and in 1848, the exports of Denmark Proper alone were 234,106 lbs.

Enough has been stated in this letter to show the rapid growth and progress of Danish agricultural industry within the last 20 years. I shall proceed, in succeeding communications, to consider at length the Danish system of agriculture and its productions, the corn trade of Denmark, the aspect of the country itself, and the condition of its inhabitants.

DENMARK.—No. II.—ITS AGRICULTURAL POPULATION.

I propose to devote this letter to an account of the present state and prospects of Danish agriculture. In order fully to comprehend these, it will first be necessary to consider the structure of society and the distribution of property in the rural districts of Denmark.

The rural population of Denmark is divisible into three great classes—the noblemen and large proprietors; the yeomen, who are either proprietors or leaseholders; and the labourers. The number of farmers is inconsiderable. As regards Denmark Proper, the public registers of taxation, combined with the very accurate and complete classification of the inhabitants which is made at each quinquennial census, furnish the means of determining with certainty the respective numbers of these classes, and the amount of landed property which is in the possession of each.

The large estates comprise about one-fifth of the landed property of the country. They are rated in the whole at 78,000 tons *hartkorn* (the meaning of which term was explained in my first letter), and may therefore be reckoned to contain 780,000 *tœnder* of land, or 975,000 English acres, the Danish *tœnde* being equal to $1\frac{1}{4}$ English acres. The great bulk of them are in the islands, the land in Jutland being mostly in the hands of small proprietors, and the large estates there forming hardly one-fourth part of the whole. Rather more than one-half of the area of this class of properties consists of the entailed estates, which are in the hands of the noblemen who hold the eighteen counties and fourteen baronies of Denmark Proper, and of thirty-two families (*stammhuser*) of gentry, to whom the privilege of entailing their estates has been specially granted, in conformity with a law made in the year 1683 by King Christian V. A count's estate (*grevshab*) ought to be so large as to be rated at 2,500 tons *hartkorn* (answering to an area of more than 30,000 English acres), but there are only a few of them which reach this extent. The rating of a barony is 1,000 tons *hartkorn* (12,500 English acres), and in most cases the baronies are large enough to furnish their complete quota. Some of the counties embrace an area of 70 English square miles, on which there may be found (besides the larger *marks* or tracts in the hands of the possessor, his agents, or his farmers), 300 yeomen's parcels (*bœndergaarde*) held of the proprietor, and a population of 7,000 souls. The baronies have generally an area of 25 English square miles, about 100 yeomen's holdings, and a population of about 2,500. Only four of these counties and baronies are to be found in Jutland, but amongst them is the largest private estate in Denmark—that of Count Früs, of Frisenborg, which extends over 200 English square miles, and is rated at 5,817 tons *hartkorn*. The estates (unentailed) of the class of proprietors who answer to our English country gentlemen, of course vary much in size; their number is 793, and they are calculated to form 9 per cent. of the whole landed property of the kingdom. About one-half of them lie in Jutland. The distinction between privileged and unprivileged estates (now about to cease) will be explained when I come to speak of the taxation of landed property. There is yet another class of estates—those in the hands of corporations and public foundations: these (including church lands) are reckoned at 31,500 tons *hartkorn*, or 393,000 acres. The chief of them are in the island of Zealand. The University of Copenhagen has an endowment of upwards of 40,000 acres; the municipality of the same city possesses about 32,000; the Academy of Sorœ 58,000, and Vallœ Cloister 20,000. It is computed that entails and public foundations preclude from one-fourth to one-third of the landed property of Denmark from coming into the market.

The management of large estates in many cases differs materially from our English system. An important feature of the rural economy of Denmark (though one by no means peculiar to it, since the same holds good both of the duchies of Schleswig and Holstein, and of nearly all north Germany) is that the proprietor often retains the whole or the greater proportion of his land in his own hands, appointing a bailiff or overseer (*forvalter*) to superintend immediately the cultivation of each of those *marks* or parcels which in England would be let out in farm. He is thus essentially a trader as well as a landowner, the ground being cultivated on his own account alone, and at his own risk. Nothing similar exists among ourselves, though it is not a very uncommon case for an English landed proprietor to retain 300 or 500 acres of his estate in his own hands for the sake of the occupation and amusement it affords him. Whatever may be thought of this system in other respects, it is a much more economical one than that which prevails with ourselves, as farming profits do not enter into the costs of management. It is difficult to say exactly what proportion of the landed property of Denmark is managed in this way, but it is certainly considerable. Count Moltké, and Count Lertke, two of the largest proprietors in Denmark, are amongst those who adopt this plan of management. The arable and meadow land on Count Moltké's estates (in the south of Zealand) amounts to nearly 40,000 English acres, besides 6,000 acres of woodland. In other cases, again, the whole or the greater proportion of a large estate is let out to a single farmer, who undertakes the management of it, generally for a term varying from twelve to twenty years.

A very numerous and interesting class of the Danish rural population are the yeomen or *bonders*—which term dates from the earliest times of Scandinavian antiquity, and means literally a settler or dweller. By the old and still subsisting law of Denmark, every parcel of settled or cultivated (*beboede*) land exceeding one ton and under twelve tons *hartkorn* (that is from 12 to 150 English acres) is considered as a yeoman's allotment, or bond-garth (*bondegaard*), and every one living by its occupancy is called a yeoman or *bonde*. The general size of such parcels is from four to eight tons *hartkorns*, or 50 to 100 acres English. Half the entire number consists of parcels of this size, and somewhat more than half the soil of Denmark is distributed into such tenements. In the year 1835 it was ascertained that there were in Denmark 7,742 such holdings, of eight tons *hartkorn* (100 acres) and upwards, the amount of their rating being 77,172 tons *hartkorn*, or almost exactly ten tons (125 acres) each. The holdings of from four to eight tons *hartkorn* (50 to 100 acres) were 28,705 in number, and their entire rating 166,532 tons *hartkorn* (answering to 2,081,650 acres), or averaging 5 tons (62 acres) each. The number of holdings rated at two to four tons *hartkorn* (25 to 50 acres), was 18,444, and those at one to two tons (12 to 25 acres), 11,599. The entire number was thus 66,490, and it is believed to have rather increased than diminished since 1835. Of these 35,695 were the property of the occupiers, 6,000 were held under a sort of perpetual lease or copyhold tenure with the right of alienating the land, being thus equivalent to a tenure in fee-simple, whilst the number held in virtue of terminable leases was only 24,795. These leases (*fœste*) are for the lives of the lessee and his wife, or for a term of fifty years—or, not so commonly, for the lives of two persons named; a fine (*indfœstning*) is paid by the lessee on taking the lease, and an inconsiderable ground-rent (*landgild*) in money or kind yearly. To secure the owner of the land against loss the lessee is bound to certain conditions, the breaking of which by him entails the forfeiture of his lease. By old custom preference is always given to the son or heir of the lessee, when the lease falls to be renewed. The following table shows the proportion of land held as manor (*hovedgaard*), yeomen's parcels in fee simple, copyhold, and lastly, land forming either the area of the towns or belonging to burgesses, in the different provinces of Denmark, and in the kingdom itself:—

	Manor Land.	Parcels in Fee-Simple.	Copy hold.	Lease-hold.	Town Land.
	pr cent	pr cent.	pr cent	pr cent	pr cent
Zealand	11.4	13.1	21.3	52.3	1.9
Moen	8.8	48.8	..	39.8	2.6
Bornholm	...	8	88.3	1.3	2.4
Fyen	10.9	35.9	0.9	50.9	1.4
Langeland	13.8	12.5	2.7	69.5	1.5
Lolland	13.5	20	8.4	55.5	2.6
Falster	8.1	35.2	2.9	52.6	1.2
Prefecture of Hjærriug	9.9	57.7	1	30.7	0.7
„ Aalborg	9.1	46.8	0.2	43.5	0.4
„ Thisted	5.8	77.4	..	15.8	1
„ Viborg	7.4	65.2	3.1	23.1	1.2
„ Randers	9.2	58.2	0.8	30.3	1.5
„ Aarhuus	7	57.7	1.2	32.3	1.8
„ Skanderborg	6.5	67.7	..	23.9	1.9
„ Ringkiœbing	5.8	88	0.1	5	1.1
„ Ribe	2.9	71.2	14.2	9.3	2.4
North Jutland	7.3	65.6	2	23.7	1.4
Denmark Proper	9.4	40	10	39	1.6

In North Jutland—that is Jutland excluding Schleswig—the yeomen's estates held in fee simple were rated at 108,844 tons *hartkorn* (answering to 1,360,550 acres); those in copyhold at 3,259 tons *hartkorn*—answering to 42,000 acres; and the leasehold tenements at 39,228 tons *hartkorn*—answering to 491,350 acres. It will be seen, from what has been stated, that the number of small estates held in fee-simple is nearly twice that of the leasehold properties; but the latter are in most cases larger than the former, and the extent of ground occupied by them is therefore not so much less as might be supposed from a comparison of the numbers. The precise relative proportions of these will be at once ascertained from an inspection of the following table, which throws the clearest possible light on this very interesting department of the rural economy and social structure of the Danish state :—

	Fee-Simple and Copyhold.		Leasehold.	
	Number.	Area.	Number.	Area.
Tenements of 100 acres and upwards	4,104	641,325	3,638	422,800
Tenements of 50 to 100 acres	14,054	985,850	14,651	1,095,800
Tenements of 25 to 100 acres	14,299	522,425	4,145	157,712
Tenements of 12 to 25 acres	9,238	164,087	2,361	41,400
Total	41,695	2,313,787	24,795	1,717,712

The average size of a leasehold tenement is thus rather above 69 acres, whilst that of a yeoman's estate in fee-simple is 55 acres. The greatest part of a leaseholder's rent was formerly paid in prædial labour on the estate of the lessor; the Danish term for the obligation is *hoveri*, which may be translated, "manorial services." The value of these services, which were often commuted for money payments, was computed at from five to six rix-dollars (11s. 3d. to 13s. 6d.) for every ten *hartkorn*, or every twelve English acres; and it would thus be 30 to 40 rix-dollars (67s. 6d. to 90s.) on an ordinary leasehold tenement. Manorial service was generally performed on a certain portion of the lessor's estate, for the due cultivation of which the lessee was held responsible—or, less frequently, by ploughing, carting, or other service on a given number of days, though the latter was generally the method stipulated in the contract. In either case the work generally fell to be performed at the husbandman's busiest season, and either rendered the proper cultivation of the yeoman's own land impossible, or obliged him to keep more horses, servants, or implements of labour than he otherwise would; on the other hand, it was usually performed in the most slevenly and ineffective manner. The whole system, in short, was prejudicial to the interests of both parties, and threw numberless obstacles in the way of agricultural improvement. It has, however, been rapidly disappearing in the course of the last thirty years, and a very short time will probably ensure its extinction. By a royal ordinance of 1838, compensation was secured to proprietors for the abolition of manorial services; the principal of the law is, that the proprietor may resume so much of the leasehold lands attached to a manor, and bound to the performance of service, as amounts to one-third of the manor. By the law of Denmark every complete manor, properly so called, must have leasehold land rated at 200 tons *hartkorn* (2,500 acres) attached to it. In 1844 there remained 8,000 leasehold tenements in Denmark, of which the occupiers were bound to the performance of these services—which are, in fact, a labour-rent. They were rated at 46,000 tons *hartkorn*, which is equivalent to an area of 575,000 acres. I am enabled to lay before the reader, in order to complete the illustration of this part of my subject, the following statement of the receipts and outlay on a leasehold farm or tenement of about 70 acres of good land held on lease:—

RECEIPTS.

	£	s.	d.		rix d.
20 quarters of wheat at 22s. 6d. (40 *tœnder* at 5 r. d.)	22	10	0	equal to	200
7½ quarters of rye at 18s. (15 *tœnder* at 4 r. d.)	6	15	0	„	60
40 quarters of barley at 13s. 6d. (80 *tœnder* at 3 r. d.)	27	0	0	„	240
37½ quarters of oats at 9s. (75 *tœnder* at 2 r. d.)	16	17	6	„	150
12½ quarters of peas at 18s. (25 *tœnder* at 4 r. d.)	11	5	0	„	100
4 quarters of vetches at 18s. (8 *tœnder* at 4 r. d)	3	12	0	„	30
From six cows	6	15	0	„	60
From sheep and swine	1	2	6	„	10
Lodging	2	5	0	„	20
	£98	2	0	„	870

OUTLAY.

State and commercial taxes	9	0	0	equal to	80
Tithes (paid to the king, the clergyman, and the church)	5	12	6	„	50
Manor dues (in lieu of service)	4	1	0	„	36
Ground-rent (*landgilde*)	5	1	6	„	45
Interest of £100 (900 r. d.) at 6 per cent.	6	0	0	„	54
Food-corn—6 qrs rye, 1 qr. wheat, 6 qrs. barley, and 22½ oats	15	15	0	„	140
Seed-corn	6	15	0	„	60
Iron, salt, brandy, &c.	5	1	6	„	45
Fuel	1	2	6	„	10
Petty charges, wear and tear, and repairs	5	12	6	„	50
	£64	1	6	„	570

This leaves a surplus of about £34 to purchase such clothes as are not made at home, and to lay by. But such a result supposes the farmer to be both intelligent and industrious, and to have his land in one of the more favourably circumstanced districts; otherwise the balance would be far from being so favourable. I may now dismiss the class of proprietors, great and small—adding only that in Denmark, as well as in many other countries, a majority of them are more or less embarrassed by debts.

I come now to speak of the labouring population employed in agriculture, whose number in Denmark Proper is calculated at 135,000, besides women and children. Of these rather more than half are employed, constantly or occasionally, at a yearly or weekly hire, as our own labourers are. Not less than 63,481 of the above number belong to the class of cotters (*hausmœnd*, houseman) each of whom occupies a piece of from 4 to 7 English acres (3 to 5½ Danish *tœnder*) in size. This may be either his own property, or leased from a landholder. The number of proprietors and leaseholders are about equally balanced, there being 31,922 of the former, and 31,559 of the latter class. About 5 per cent. of the land of the country is occupied in this manner. It is to be observed that amongst this class the proprietary holdings are larger than the leasehold—the former being generally about 7 English acres in size, and the latter from 4 to 5 acres. It has been further ascertained, by a comparison of tax and census lists, that of 26,557 cottages occupied by labourers and their families, but without land attached to them—landless houses, as they are called—13,951 are the property of the occupiers, and 12,606 leased or rented. From a consideration of these numbers it will be apparent that even in the labouring class of Denmark the proprietary element is large. On this subject, however, the most enlightened statists and economists of Denmark seem to have arrived at the conclusion that the possession of a piece of land, too small (in the existing circumstances of Denmark) to afford the means of comfortable subsistence for a family, and too large to be cultivated properly by persons who have neither sufficient means nor time for that purpose, is at best but a doubtful advantage. Those who have studied the annals of our own country during the middle ages are aware that, down to the later times of the Tudor dynasty, the English labourer generally possessed a farm of 4 or 5 acres in extent, and that the transformation of the labouring class from a partially proprietary status into that of persons depending on wages alone for subsistence, was not fully effected until a period long subsequent to the Reformation. As the matter stands in Denmark, the husbandman, his land not being sufficient to enable him to keep horses, is obliged to have it ploughed by others—generally by one of the neighbouring small farmers, who often exacts an exorbitant price (paid commonly not in money, but in prædial service) for work which he only does at his own convenience. The ordinary cost of ploughing, to the peasant proprietor or leaseholder, is about two *marks* (9d. English) per rood, besides the ploughman's meat—so that when the land is ploughed thrice the expense comes to four rix-dollars the *tœnde*, or 8s. the acre; and a peasant holding four acres of land, the half of which is under the plough, has therefore about six rix-dollars, or 13s. 6d. to pay, or 36 days to work, to defray the charges of ploughing, though he sometimes obtains more favourable terms from the proprietor of an estate. Various plans have been started with a view to the removal of this drawback, but the outlay required from the peasant for new tools, and that aversion to innovations which is so prominent a feature in the agricultural character in all countries, are no trifling obstacles to their success. It is not impossible, however, that these difficulties may be overcome, and that the processes of the Danish peasant proprietors, or farmers, may be improved until their cultivation shall be on a level with that of the Belgians. The peasantry are also bound by law to work in certain cases on the roads, in the repair of churches, &c.; but these obligations, often onerous, and always vexatious—though it is impossible from their indeterminate nature to ascertain their exact amount or value—are now generally commuted for money payments, levied under the head of communal or departmental taxes. If these inconveniences are severely felt by the peasant proprietors, it may be imagined that they press still more hardly on the leaseholders who have rent to pay in addition. This rent is seldom paid in cash; but a labour-payment, though I have not found that the rates exacted are considered unreasonable, generally turns out heavier than a money payment. The highest labour-rent mentioned to me was, for a house with 3¾ acres (three *tœnder*) of land, two days' work in the week and twelve extra days in harvest, the peasant finding his own food. This is a rate not uncommon in the isle of Lolland, where the land is more valuable than in most other districts of Denmark. Three *tœnder* of land in Lolland are worth at least 400 rix-dollars, and the house 200 more—the yearly interest of which at 4 per cent. is 24 rix-dollars; and the value of two days' labour a-week and twelve extra days in harvest is calculated at 18 rix dollars. A day's labour cannot be estimated higher than one mark (4½d. English) a-day, since many landowners have in vain offered the peasant the commutation of his labour for a money payment to this amount. The fine, or *indfœstning*, payable by the lessee at his entrance on the lease, may be set down at 125 rix-dollars, the interest of which at 6 per cent. is 7½ rix-dollars—so that the husbandman's rent on the whole may be estimated at 26½ rix-dollars, or £3 sterling yearly, being little more than the ordinary interest on the capital value of the land, and no more than that interest in cases where the taxes are paid by the lessor, as they generally are. This, however, may be regarded as an unfavourable case—the ordinary labour rent required for a house with from five to ten acres being two days' work in the week, and for a house with 3¾ acres (three *tœnder*) one day's work in the week, with a money payment for the house of eight or ten rix-dollars. When the labourer's services are always available to the proprietor of an estate at will, the rent charged is naturally much lower. Generally I am disposed to think that the rates of wages vary as much in Denmark as they do anywhere, being determined of course by the circumstances of the locality, and the efficiency of the labourer; but I do not think it can be said that there is any district of Denmark where the labour market is overstocked; and, looking at what remains to be effected for the improvement of agriculture, a much larger amount of labour might be employed in cultivation than actually is employed. On two of the best-managed large estates in Denmark I found the following rates to exist:—For farm-servants boarded in the house—men, 40 rix-dollars (£4 10s.) a-year; women, 28 rix-dollars (£3 3s.) For workmen temporarily employed at money wages, 2 marks (9d. English) a-day, without board, with milk and beer or spirits in harvest-time. Task-work produces to the labourer about half as much more as when he is paid by the day. On the estate of Adlersborg, in North Zealand—the property of Baron Adler, one of the most enterprising and spirited agriculturists in Denmark—the fine or *indfœstning* for a labourer's house, with three *tœnder* (3¾ acres) land, leased to him for his own life-time and that of his wife is 80 rix-dollars (£4 10s.), and the annual rent, or *landgylle*, 20 rix-dollars (£2 5s.) In this case the old labour-rent was commuted into a money payment, but in by far the greater number of cases the whole or a portion of the rent is paid in labour. I am enabled to lay before your readers the following statement of the yearly incomings and outgoings of one of this class of tenant-labourers, on the immense estates of Count Reventlow, of Christianssœde, in the isle of Lolland. Count Reventlow's estate consists of 32,000 English acres, more than 4,000 of which are woodland. The labourer's parcel is 3¾ acres, and is ploughed with his own cows—a condition which is made indispensable to the granting of leases on the estates of this nobleman, with the view of saving the labourer the cost of having his land ploughed by a farmer:—

RECEIPTS.

2¼ quarters rye, at 16s. 8d. (4½ *tœnder* at 20 marks)	£1	13	9	equal to	15 rix-dollars
4½ qrs. barley, at 13s. 4d. (9 *tœnder* at 16 marks)	2	14	0	„	24 rix-dollars
From two cows....	5	12	6	„	50 rix-dollars
From flax, wool, and a lamb..........	1	2	6	„	10 rix-dollars
Lodging..........	0	18	0	„	8 rix-dollars
	£12	0	0	equal to	107 rix-dollars.

OUTLAY.

Public and communal taxes	£0	13	6	equal to	6 rix-dollars
Yearly house-rent ..	1	2	6	„	10 rix-dollars
48 days' work, valued at 1½ marks (7d. English)	1	7	0	„	12 rix-dollars
Seed-corn : 2 bushels rye and 4 barley..	0	9	9	„	4 rix-dollars 2 marks
Three quarters (six *tœnder*) barley for cows	1	16	0	„	16 rix-dollars
Work on his land ..	0	18	0	„	8 rix-dollars
Tithes............	0	5	3	„	2 rix-dollars 2 marks
Interest of 125 rix-dollars fine, at 6 per cent.........	0	17	11	„	7 rix-dollars 3 marks
	£7	9	0	equal to	66 rix-dollars 1 mark

This statement gives a yearly overplus of 41 rix-dollars, or £5 12s. With regard to the yeoman's farms above described, I should state that in many cases a portion of the rent is paid in kind. A Zealand yeoman, holding a lease of 61 acres (50 *tœnder*) of land furnished me the following statement of his rent :—

Yearly money payment....................	£3	19	(35 rds.)
Two quarters (4 *tœnder*) rye.................	1	10	(16 „)
Seven and a-half quarters (15 *tœnder*) barley	5	1	(45 „)
One quarter (2 *tœnder*) oats..................	0	9	(4 „)
Add interest on fine of 800 rix-dollars, at 6 per cent..............................	5	8	(48 „)

Making in all 148 rix-dollars (say £17), which is a low rent; the land, however, is rather under the average quality. The average price of land in Denmark may be stated at 100 dollars the *tœnde* (say £9 the acre, a *tœnde* being 1¼ acres), and the rent at 4 dollars the *tœnde*, or 7s. 3d. the acre—answering to an interest of 4 per cent. on the capital. In further illustration of the subject of the *bondergaarde*, or yeomen's farms, I subjoin the conditions of the leases granted on one of the chief baronial estates of Zealand, from the printed form of contract which now lies before me:—

"1. The farmer is to pay, punctually at the legal term, to the baron, or his authorized agent, all public and communal taxes, imposts, and prestations due or to be rendered from the farm, by whatsoever name they may be called, which are now or may hereafter be required by law, as well as all personal taxes or imposts due from himself or his family, in the same manner as if he were himself the owner of the land.

"2. He is to pay *tœnder* of rye, barley, oats, with —— rix-dollars yearly. If in money, the grain is to be valued at the assize price (*kapitelstaxt*), the amount to be paid fourteen days after the same is declared, and the fixed money payment to be made on the 1st of November of each year. The proprietor (*eier*) reserves to himself the right of requiring the grain to be paid in kind, upon giving one year's notice to the farmer; and in such case the farmer is to deliver the grain at the barony, or at one of the three nearest towns, or on board ship (the sea being close at hand), as the proprietor may determine. The grain to be in good sound marketable condition. The tithes due from the farm are to be paid by the farmer to the legal recipient; those belonging to the proprietor to be paid at the same time as the rent.

"3. The farmer must cultivate the land farmed to him in such a manner that its productiveness shall in no case be impaired, and must therefore follow a determinate plan. He is in no case to allow manure, straw, or hay to go off the farm, or to use any of the fodder for fuel. Should the proprietor find occasion to complain of unwarrantable treatment of the land, he has the right to appoint a legal inquisition to be taken by men nominated thereto, according to law, who are to decide, to the best of their judgment, whether the farmer, with the stipulation against injuring the land before his eyes, has treated it unwarrantably; if this should prove so, the proprietor is authorised to call upon the farmer to desist from this mode of acting, as well as to make restitution for the damage which may have been already occasioned. When the farmer quits the land he is to give it up sown with winter seed, and the owner is to have access to it until it shall be sown with spring seed. The farmer must not cut turf on the ground until he has given intimation to the proprietor.

"4. The farmer is himself to fix the stock of horses, waggons, ploughs, harrows, and other gear; seed-corn and food-corn required for the barn; all which shall be delivered over to him along with the farm-buildings, under legal inquisition. This stock, although it is to remain the property of the farmer shall not be diminished during the term of the lease, but shall be preserved on the property during the whole period, and when the lease passes to another, it is to be notified by legal inquisition that the new lessee has received the stock. The farmer must insure his stock against fire, and inform the proprietor on every occasion of renewing the policy of insurance. The farm-buildings are to be delivered over to the farmer at the same inquisition as the stock, in the condition in which they are standing. During the term of his lease, the farmer is bound to maintain the buildings in good condition, and the proprietor has the right of inspecting them. If the farmer allow the buildings to sustain injury, and this be not repaired within a fixed term, the proprietor is entitled to have the damages examined by an inquest, and the farmer shall make them good under pain of legal process.

"5. In case the farmer fall into arrears of rent, tithe, or taxes, and be sued by the proprietor, and adjudged by sentence or arbitration to pay the arrears, the farmer is to make them good within a term of 16 weeks from the day of payment fixed by such sentence or arbitration. and, if not, the lease is to be forfeited, and the owner is entitled to make over the farm to another party, and to require the same to be delivered up in conformity with the precognition of the inquest.

"6. The farmer is debarred from sporting of any sort; the rights of chase on the ground are reserved to the proprietor and to those to whom he may grant permission.

"7. The farmer is precluded from transferring the property leased, or any part of it, to others, without the proprietor's consent; but he has the option of giving up the lease. In this case it is to be disposed of by public auction, and the proprietor is entitled to resume the ground, on paying the highest bid offered at the auction, within a term of 14 days.

"8. The proprietor has priority of claim on the stock and produce for the due discharge of rent and taxes by the tenant; and if the claims shall amount to more than the whole of the stock, then the tenant's remaining property is answerable. The contract is to be registered, both as a security to the proprietor and as evidence of the tenant's right to the usufruct of the land.

"9. The tenant is bound to keep the out-fences of his farm in repair. The tenant is bound to plant every year 50 fathoms of land with ash, fir, or other suitable species of trees, and to replant gaps which may have been made; this is to be continued until all the out-fence of the farm is planted. In case of neglect of such planting or re-planting, he is bound for every year during which he shall have neglected it to contribute a *tœnde* (half a quarter) of barley to the poor-box of the parish.

"10. The tenant is entitled to a renewal of the contract for fifty years, on offering to pay the proprietor an increased yearly rent. If such an offer is made in the first ten years, the proprietor shall either accept it or buy out the tenant by paying twenty times the amount of yearly increase offered; *e. g.*, if the tenant offers to pay in rent five quarters of barley more than before, the proprietor, in case he does not accept the proffer, shall give the tenant an indemnity of 100 quarters of barley. If the tenant makes an offer in the course of the next ten years, and it is not accepted, then the proprietor shall pay to the tenant an indemnity of sixteen times the amount of the offered yearly increase. If the offer is made within the third term of ten years, and refused, then the indemnity is to be fourteen times the amount of the offered yearly increase; if in the fourth ten years, twelve times such amount; if after 40 to 45 years, the indemnity is to be ten times the amount; and if in the 45th, 46th, 47th, or 48th, five times the amount. In the last year the proprietor shall neither be bound to renew the contract nor to give an indemnity for not renewing it.

"11. A fine or acknowledgment of   rix-dollars is to be paid on the subscription of this contract, but any portion of it may remain unpaid on the tenant engaging to make a yearly payment of eight per cent. interest on the sum.

"12. The tenant may sublet two *tœnders* (2½ acres) land, to be attached to one or two houses, in any angle of his ground.

"13. All the costs of transfer, the stamp and registry of the contract, and the survey of the ground on delivery, are to be borne by the tenant."

DENMARK.—No. III.—ITS AGRICULTURAL SYSTEM.

The relations which exist between the different classes of the agricultural population in the Duchies of Schleswig (or, according to the Danish orthography, Slesvig) and Holstein are the same as those which I have described as existing in Denmark Proper. The class of housemen, or labouring cotters, provided with land (here called *kaadner* or *käthner*), is, however, far from being so numerous, and the greatest part of the land is held by large proprietors. In Schleswig there are 117 large estates, which, with the lands belonging to St. John's Cloister, cover an area of 750 square miles, and have a population of 63,391 persons; indeed, along the east coast of the Peninsula, from Flensburg to the southern frontier of Holstein, stretches an almost unbroken series of estates, belonging to the nobility of the country. In Holstein there are about 200 noble and other large estates, scattered over its whole surface, excepting the district of Dithmarsch, on the west coast. In the Duchies the class of yeomen proprietors is as numerous and considerable as in Denmark. What is called a *heelgard* (wholegarth or yeoman's farm) in Schleswig, and a *bohl, huf*, or *hof*, in Holstein, consists of 100 *tœnder* or *steuertonnen* of land, of 120 English acres. Of these there are 3,100 in Schleswig, and 4,200 in Holstein, three-fourths of the latter being the property of the occupiers. There are besides in Schleswig 12,000 smaller properties, and in Holstein 6,000, which have been formed by the partition of whole garths or *hofs* into halves and quarters. In the district of Dithmarsch these divisions do not exist, being unknown to the old Frisic law. In the small but fertile province of Lauenburg, lying between the Elbe and the Trave, the whole extent of which is not 500 square miles, there are about forty large estates, and the yeomen generally hold their lands (as in Schleswig) by the copyhold or hereditary leasehold tenure, called *arvefæste* in Danish, and *erbpacht* in German.

The taxes on land are the land-tax, amounting to one rix-dollar per *tœnde* of *hartkorn*, or 2d. the acre on one class—and to one rix-dollar, three marks per *tœnde* of *hartkorn*, or 2½d. the acre on another class of properties—and producing in all 2,461,000 rix-dollars, or £275,000; the communal taxes, including the charges for criminal prosecutions, which in England fall on the county-rates; the tithes, poor-rate (amounting to 1 rix-dollar 13 skillings the *tœnde* of *hartkorn*, say 2½d. the acre), the school-tax (1 rix-dollar 29 skillings the *tœnde* of *hartkorn*, say 3d. the acre), and the expense of highways. There is also a bank annuity-tax, which originated thirty years back, when the Bank of Copenhagen was established, in order to rescue the paper currency of Denmark from the depression into which it had fallen. A tax of 6 per cent. on all property in houses and lands was imposed for the purpose of forming a solid capital for the bank. When the proprietors could not advance the requisite sum, it remained as a mortgage on the property, chargeable with interest.

Most of these taxes (besides other occasional imposts, as billeting troops, royal purveyance, and furnishing horses on requisition for government service) have hitherto fallen with much greater severity on what are called the unprivileged than upon the privileged estates. The following is an estimate of the amount of taxes payable on every *tœnde* of *hartkorn*, answering to 13 acres English, privileged and unprivileged:—

	PRIVILEGED.				UNPRIVILEGED.			
	rds.	sk.	s.	d.	rds.	sk.	s.	d.
Government taxes..	6	8=	13	9 ..	8	64=	18	10 sterling
Communal taxes ..	4	32=	9	9 ..	7	80=	17	9
Tithes, horse-service, and bank tax....	1	16=	2	8 ..	4	80=	11	0
	11	56=	26	2 ..	21	32=	47	7

The distinction between privileged and unprivileged estates had its rise in the ancient privileges of the Scandinavian nobility, which included exemption from all imposts not immediately connected with military service, not only for themselves and their lands, but also for those of their vassals or tenantry. The unequal distribution of the public burdens thence arising, though much modified in recent times (especially in the kingdom of Denmark, for the system of taxation prevailing in the Duchies has been much more vicious), has continued to be a fertile source of grievance and discontent. A remedy, however, has at length been applied, for, by a law passed this year during the session of the late Diet, the distinction alluded to is to cease and determine from the commencement of the year 1851. But as many or most of the existing privileged estates had been acquired by persons who purchased their land in the belief that the exemptions were to continue, and who of course gave a higher price for the ground on that account, the Danish Diet considered itself bound in justice to grant an indemnity to the owners of privileged land; and accordingly the law in question contains a provision for such indemnity, which consists in the allotment of shares in the public funds, a new stock being added to the national debt for that purpose. The estimate given above, I should observe, does not include the extraordinary taxes, the imposition of which is one of the disastrous effects of the present unfortunate hostilities, and which are calculated at from one-third to one-half the amount of the ordinary taxes. As regards the ordinary taxes on that large portion of the land of Denmark which, as I have shown, is in the hands of small leasehold farmers, the above estimate would probably be found too high. A statement which I obtained of the taxes paid on a farm rated at seven tons *kartkorn*, and containing rather more than 100 acres of land at Faaerveile, in North Zealand, makes the total amount of taxes payable 32 rix-dollars (£3 11s. 6d.), including 1rd. 4mks. 8sk., or 4s. English, for the maintenance of the families of soldiers engaged in active service. The distinction above explained of course affected the class of small proprietors or leaseholders as much as any other, since the majority of the latter, holding land belonging to the possessors of privileged estates, paid only the privileged rate of taxes. It is impossible not to admire the energy, firmness, and wisdom of a nation which, under the pressure of the evils and calamities that follow in the train of war, calmly provides for the extinction of abuses that have heretofore disfigured its financial system, and effects important social reforms in times of urgent difficulty. Amongst the effects of the present war, not the least remarkable is that which it has had upon the wages of agricultural labour. With such a system as I have described, it is evident that fluctuations in the rate of wages must fall chiefly on the class who labour, occasionally or constantly, for a fixed money payment, and I heard everywhere that wages were now from 70 to 100 per cent. higher in consequence. For the last two years, the efforts required in a contest where the insurgent subjects of the Danish Crown were backed, openly or covertly, by a considerable portion of Germany, have obliged Denmark to maintain an army and navy disproportionately large when compared with her population and resources, and have withdrawn from the labour market large numbers of the most active and able-bodied men, who would otherwise be available for the pursuits of agriculture.

I was agreeably surprised to find the condition of agriculture in Denmark Proper so far advanced since the days of Mr. Jacob, who describes it as being in the rudest state, and conducted with little or no expenditure on the part of the proprietors. One of the best proofs that can be given of the progress which has been made since his day is to be found in the fact, that the use of the clumsy and comparatively useless wheel-plough (which still maintains its ground in Germany, France, and in some parts of England) has been universally abandoned, and the swing-plough, or Scottish plough, has been introduced in its stead. This implement is generally made entirely of iron; the favourite pattern, which is said to have come from the United States, and is generally called the North American—but which differs in hardly any appreciable respect from the best of our own models—is made very small and light, with a long share and a deep and rather wall-sided coulter. It would be too light undoubtedly for our heavy wet clay soils, but it is admirably adapted for turning up the friable and easily-broken soil of the Danish islands. It costs no more than seventeen rix-dollars (thirty-eight shillings English), and is, therefore, equally available for the small farmers above the rank of cotters as for the wealthiest landowners. At Odense, in the island of Fyen, there is an iron manufactory conducted by Mr. Allerup, which, in the space of four years, sold no fewer than 12,000 such ploughs; and there are several other iron-foundries and smithies, in the islands, in Jutland, and in the Duchies, in which the fabrication of agricultural instruments forms the chief branch of business. In Copenhagen there are sixteen such establishments, of which the four largest produce about 25,000 cwts. of iron goods yearly. Some of the farmers of whom I inquired told me, that with the swing-plough, driven by a man and two horses, they could plough nearly twice as much land in a day as with the wheel-plough, driven by two men and four horses or bullocks; and no one who has seen the models common in some parts of the continent, which look as if they had been framed before mankind applied themselves to the study of mechanics, can doubt the accuracy of the statement. In this respect, then, the agriculture of Denmark must be considered decidedly more advanced than our own. With regard to other agricultural implements, I found that the most approved models were well known upon almost all the considerable estates or farms, though their use is not so general as that of the plough. The harrow most liked in Denmark is called the Swedish harrow, and is considered a more efficient implement than that of the ordinary pattern. It is curved in front, which, as regards facility of movement, is an undoubted improvement on the strictly four-square principle. The teeth are remarkably strong and long, and it serves the purpose both of a scarifier and of a harrow. This is reckoned the best species, but both the quadrangular and triangular forms are in use, and more general than the other, which is but a few years old. The sowing machine has been used for some years upon several estates, and for the last year or two upon many more; and I found a machine, which was represented to me as a new pattern, the result of a series of experiments which the inventor had instituted, and in which he professed to have used the best English models. Scarifiers, clod-crushers, and the whole host of instruments which are not twenty years old in England—and some that scared the ears of our public not long ago, when their existence was made known at the annual meeting of the Royal Agricultural Society—are known and used by the most active Danish agriculturists, who profit by modern facilities of communication to import all the novelties of English or American invention. The light soil of Denmark, however, which seems as if it could be broken up with the application of only half the force that our own requires, makes the utility of these new contrivances more questionable than it is at home. Thrashing machines are general on farms of 500 acres and upwards, but I met with no instance of any worked by steam.

The remote position of Denmark (for such it was in days when steam was unknown), and the antiquated arrangements of its social economy, caused its agriculture to lag some years behind the march of amelioration until a recent period; but the genius of the age has introduced improvements which have hardly yet been tried in some other countries more favoured by nature, and which advance loud pretensions to be regarded as the leaders of civilization. The Danish government (which has been distinguished for a long time as the liberal and enlightened patron of the arts) sends out from time to time the most promising pupils of the Polytechnic School of Copenhagen, to travel in foreign countries, and study the working both of institutions and inventions which may seem likely to be beneficial if introduced into Denmark. I had the pleasure of forming the acquaintance of more than one of these gentlemen, who had spent two or three years in different parts of Europe for this purpose, and whom I found perfectly conversant with the agricultural system and condition of England and Scotland, as well as of France and Germany. I could not help thinking that such a practice might be worthy of imitation by ourselves, for it is certain that, even in the useful arts, we do not always take the lead in invention. An agricultural society has existed in Copenhagen for thirty years —a much longer period than the Royal Agricultural Society has been established in England; and there are district agricultural societies in the provinces, which take a warm interest in the promotion of the science. Denmark possesses, and has possessed for a generation past, among her large landed proprietors, a number of zealous and enlightened lovers and patrons of agriculture, who take the lead in improvements of all kinds. Upon their estates the old system of rural economy has been completely changed, and all manorial services and duty work (*hoveri*) have been commuted into money payments. Such is the case on the estates of Count Ashlefeldt in Langeland, comprehending more than 30,000 English acres; those of Count Hardenberg-Reventlow and Count Knuth, in Lolland, of nearly equal magnitude; of Count Früs, in Jutland; Count Petersdorff and Baron Holsten, in Fyen; Baron Gannö, in Zealand, and many others. The progress of agriculture has been particularly rapid within the last ten years, during which the yearly increasing importance and value of the English market has of course stimulated the proprietors to greater exertion. It is a fortunate circumstance for Denmark, that, though not exempt from the losses entailed by indifferent harvests, a failure of crops sufficient to cause dearth is almost unknown; and the Danish islands appear much less liable to this calamity than the British. So long ago as 1828, when cultivation was in a state much less favourable than at present, and when the hopes of the husbandman therefore rested on a less secure basis, the Agricultural Society of Copenhagen declared, in answering some questions addressed to them by the British ambassador:—"This country is seldom subject to bad crops; for if we have sufficient rain once or twice before the latter end of June, we may be sure of a plentiful produce."

The rotation of crops which has been most generally followed in Denmark comprises a space of twelve years (the ground being twice manured). It is as follows:—1st year, fallow; 2nd, wheat or rye; 3rd, barley; 4th, oats; 5th, clover; 6th, clover; 7th, wheat or rye; 8th, peas; 9th, barley; 10th, oats; 11th, clover; 12th, clover. When the soil is fertile, the fallow is sown either with vetches, or with a mixture of vetches and oats, which is cut green, or with potatoes, but seldom with turnips. Turnip husbandry, in fact, is almost unknown in Denmark, though in many cases it might be followed with advantage; but proprietors and farmers have strong prejudices against it, and say that feeding the cattle on turnips would taint their milk and butter, to which they look as among their chief articles of produce. Some Danes who had resided in England, speaking on this subject to me, insisted that in some parts of England the milk of the cows tasted strongly of turnips.

It depends on the quality of the soil how often the fallow is ploughed when it is not to be sown. The strong soil requires more ploughing than the light; but in general the land is ploughed once in autumn, and three times during the ensuing summer. As often as the weeds appear it is harrowed until it crumbles. The roller is used when the ground is hard and clodded, and in that case it is harrowed and rolled alternately until it is quite crumbled. From 24,000 to 30,000 pounds of manure on the average are used for each tonne, and the large stocks of cattle kept generally ensure a sufficient supply; on farms where large flocks of sheep are kept, they are usually folded for the purpose of manuring the land. At the conclusion of the rotation the field is usually sown with red clover; and if it is to be laid down for several years, different sorts of grass are sown together with, or sometimes without, the clover; the most common are *solium perenne, bromus avenarius, bromus mollis,* and *holcus lunatus.* The first year's produce is usually cut, but during the ensuing years it is used for grazing cattle and sheep.

A few years ago the above system would have been considered heretical in England, and perhaps it will still be so regarded by many persons, as having two and even three white crops following each other; but it is remarkable that some of our greatest agricultural oracles have lately pronounced in favour of a similar system, as distinguished from the alternation of white and green crops, and have begun to rebuke the inveterate sticklers for rotation as blind to the teachings of experience. This should induce caution before the Danish practice is condemned. At all events, the above rotation, or one founded upon the same principle, is found to answer well in Denmark; and it must not be forgotten that, owing to the difference of soil or climate, green crops are neither an object of so much importance in Denmark, nor yield so well as in England. Another course which I found adopted was as follows:—Fallow, and plentiful manure laid down in the autumn; wheat and rye; peas, potatoes, and vetches; barley; oats; three years clover. This had been adopted in preference to the following, which was in use a few years back:—Oats; fallow and manure; winterseed; peas and vetches; barley; three years clover. The chief object of tillage is barley, which is found to produce much more plentifully in the soil of Denmark than wheat, except indeed in the strong clay lands of Lolland and Falsten, where Mr. Pusey would see as good wheat lands as could be shown by most of his colleagues in the Agricultural Society. It should be observed that in respect to manures the Danish farmers show more backwardness in adopting modern innovations than in regard to the use of improved implements. I could not learn that guano had been tried (probably the expense deterred), and bones have not been used to any extent. The quantity of oil-cake used is inconsiderable; the high prices obtained for the article in England cause the great bulk to be exported there. Marl is the favourite physic for the ground, and has been found of vast utility in giving strength and consistency to their light sandy soils. It has been used for about thirty years—at first injudiciously, as it was imagined that marling would allow the farmer to dispense with the use of any other manure, a mistake which was soon discovered from the exhaustion of the soil. The soil of Denmark, both on the islands and the peninsula, is believed to have been formed from corallines, converted in the lapse of ages into calcareous earth, and covered with sand, gravel, or clay, which thus, in some combinations with a mixture of mould, becomes very fertile, and is easily worked. The productiveness of the land varies, according to its natural quality and the excellence or otherwise of its cultivation, from 16 to 90 bushels of barley the *tœnde.* The last was the largest yield stated to me, and answers to 72 bushels the acre; but this was considered extraordinary, and the average crop of barley from land of fair, but not the best quality, is 56 to 60 bushels the *tœnde*, or 44 to 48 bushels the acre. As large a return of wheat as this latter amount has been obtained in some instances, but the average is from 38 to 40 bushels. The wheat cultivation of Denmark, however, is now inconsiderable; it forms only 3½ per cent. of the entire corn produce, and the chief subject of tillage is barley. The different descriptions of grain, and the quantities produced, will be better considered when I come to speak of the corn trade.

Potatoes are now more extensively used and cultivated in Denmark than they were twenty years back, though still far from being so much so as in England. The production is estimated at 2,00,000 *tœnder*, or 1,000,000 cwts., of which 174,000 cwts. are used in the manufacture of spirits. In 1844 and 1845 the export of potatoes amounted each year to 130,000 cwts.; but in 1846 and 1847 it fell to 60,000 and 70,000 cwts.

The cultivation of rape-seed was introduced into Denmark Proper, like some other agricultural improvements, from the Duchies of Schleswig and Holstein; but the amount grown is comparatively insignificant. The crop has been found so precarious that it is considered little better than a gambling speculation, and attempts to raise it have consequently been abandoned by many who prefer certain and steady returns. Sometimes it yields twenty or twenty-two fold—at other times so trifling is the quantity which comes up, that it is ploughed down for manure. Tenfold is considered a good return. It is chiefly raised by the smaller proprietors and yeomen of Langeland, Moen, and Fyen, who are tempted by the large profits that an abundant crop of the article produces. In the Duchies its cultivation is found to answer much better in the marshy soils, and, indeed, it is so general in some localities that it is spoken of *par excellence* as "the crop." In Denmark Proper only the common winter rape (*Brasica napus oleifera*) is raised—or, when this fails and must be ploughed down, the summer rape, which yields smaller returns, both of seed and oil. In the Duchy of Holstein the *Brasica rapa oleifera* (or *rübs*, as it is called) is more common; though smaller both in the stalk and the seed, it is less liable to be attacked by insects, from which the other variety suffers so much; it can also be sown later, and may therefore be used to sow ground on which the common rape has been killed by frosts or otherwise; it thrives better than the latter on poorer or rawer soil, and ripens earlier. The large Holstein farmers generally grow both species, in order to adapt the growth to the soil, and divide the work of the harvest better. It is an unattractive plant, with a yellow flower, not unlike the ordinary corn-tare, and comes up very unequally in the same field.

Denmark has no large linen-factories, but the weaving of linen forms an important branch of domestic industry amongst her rural population. The production of flax is calculated at 3,500,000lb., two-thirds of which are grown in the kingdom, and one-third in the Duchies. This is not sufficient for the home consumption, and the imports of flax amount to 2,000,000 lb., besides 1,000,000 lb. of linen goods and yarn. It is chiefly raised by the yeomen and cotters for their own use; large farmers have rarely more than 20 to 30 acres of land under flax. Its cultivation is shown by the amount of exports to be increasing, and it might form a much more important article of production in Denmark than it does, but for the want of good flax-dressers and spinners. There are but a few small bleaching-greens in the whole of Denmark, where the plant can be properly dressed and prepared for the market. Strength, however, and not fineness, being the chief object in the manufacture of the coarse home-woven linen, nicety in the preparation of the plant is of less consequence.

DENMARK.—No. IV.—ITS AGRICULTURE.

The former condition of agriculture in Denmark was such as, though abolished in England for centuries, may still be found subsisting in some parts of the European Continent, into which the spirit of agricultural improvement has only partially, or hardly at all, penetrated. The small properties of the yeomen, which, on the whole, are still cultivated in a style much inferior to those of the great landowners, did not, as they do now, lie in one compact allotment, but were scattered in little bits, and unenclosed, over a wide surface. The yeomen and peasantry of a district lived together in villages and hamlets, and their lands, which were, in fact, held by a species of commonage (*fœllesskab* answering to our word fellowship), were divided to each occupier in separate fragments over the whole common fields, because, if parcelled out in distinct farms, some of the allotments must have been removed to a great distance from the village. The cause of these arrangements must be sought in the insecurity of life and property which almost always reigned in the mediæval period, obliging men to congregate in towns and villages for their common safety—and also in the fact that such villages were originally formed by the followers of the Scandinavian or Teutonic chief who first settled in and appropriated the individual tract. This state of things was terminated by the royal ordinances of 1781 and 1792, which enjoined and regulated the re-distribution of all lands thus held, and which are considered the starting points of agricultural improvement, at least in so far as the smaller estates or farms are concerned. Some vestiges of it, however, are still left—for, so lately as 1837, inquiries instituted by the Danish Government ascertained the fact that the amount of land remaining divided in this irregular and semi-barbarous manner (though an analogous fashion prevails with regard to the small lots of the French peasantry) was 64,100 *tœnder* (80,000 acres) or one per cent. of the area of Denmark. The reluctance of the peasantry to remove from their village-houses, and the want of agreement amongst themselves as to the equivalents to be given for their former holdings (the difference of soil and situation in respect to roads, ditches, fences, and the like, making it frequently difficult enough to decide), opposed great obstacles to a change—which, however, was essential to the practice of any rational system of husbandry. In the parish of Faxœ, in Zealand, there still remain 2,500 acres held under the old system unchanged, and some of the yeoman-proprietors have land in eighty or more different places; the main ground of their antipathy to change being the fear that they would obtain less of the land which abounds in limestone, under a new arrangement.

The old system of husbandry practised under this condition of things, and still subsisting without material variation in the few spots where the circumstances remain unaltered, consisted in dividing the tilled ground into three fields or portions —of which one bore winter corn, the second spring corn, and the third lay fallow, a piece of ground being kept untilled as pasture for the cattle, a system under which, as the pasture ground became encroached upon from the increasing incentives to tillage, it was found impossible either to maintain a due number of cattle on the ground, or to obtain manure sufficient for tis cultivation. The custom of commonage obliged every husbandman to follow the same course of culture, under the penalty of having his land overrun, and his crops eaten by his neighbour's cattle; but as soon as it was abolished a change for the better took place, and a system of convertible husbandry was introduced, similar to what exists in Holstein, and is called *kobbeldrift*, which consisted in dividing the land into seven *marks* or portions, with three years corn-seed, and four years grass or clover. At present the large stock of cattle which is kept both by large and small farmers in Denmark, butter and milk being often regarded as more important objects than corn, provides them with an abundant supply of manure. When the last cattle census was made, in 1838, it was found that Denmark Proper contained 563,093 cows, 271,000 bullocks and calves, and 1,164,544 sheep. On every 1,200 acres, it is calculated that there are about 250 horned cattle.

It is evident that with such a stock of animals as this, the country possesses all the materials of an active cattle-trade. That such a trade has not yet been established, and that the very inadequate supply of butcher-meat in England has not been augmented by the proportion which Denmark might easily spare us, is attributable to two causes: first, the prejudice of the Danish farmers, in common with those of the Duchies, in favour of butter, and their aversion to the use of turnips and oil-cake for fattening cattle; and next to the unfortunate circumstances of the last three years, which have opposed a fatal bar to all progress in this line. In Denmark itself the cattle and dairy farmer finds a ready and lucrative return for all the products of his industry. The consumption of meat is estimated in Copenhagen at eighty-six pounds per head yearly (besides thirty-six pounds of pork); in the provincial towns at eighty pounds per head yearly (besides forty pounds of pork); and in the country, where the quantity of pork used is much greater than that of other meat, the former is calculated at forty pounds, and the latter at eighteen. The consumption of butter is estimated at thirty-six pounds a head yearly in Copenhagen, twenty-six pounds in the provincial towns, and sixteen pounds in the country. It would be curious to compare these rates with the estimated consumption per head in England, but I have not the means of reference at hand. In Prussia the consumption of meat and Pork is estimated at thirty-five pounds a head, and that of butter at only two pounds a head.

In Schleswig and Holstein the proportion of cattle is even larger than in Denmark. In 1845 it was found that the total number of horned cattle in the Duchies was 528,803, and of sheep 323,064. Holstein possesses 169,256 milk cows, with 79,278 bullocks and calves; Schleswig 152,494 milk cows, with 127,775 bullocks and calves.

There are few districts in examining the husbandry and social relations of which an Englishman finds more to interest him than in the southern portion of that peninsula of Jutland, from which issued the Gothic tribes, Saxons, Jutes, and Frisians, who settled in England about fifteen centuries ago. At every step he finds something, either in the language, customs, or houses of the inhabitants, which reminds him of that affinity, the traces of which neither distance nor the lapse of ages have been able altogether to obliterate. In the population of Schleswig and Holstein, the Scandinavian, Teutonic, and Frisic elements are mingled—the first predominating in the north, the second almost exclusively in the south, and the third stretching along the west coast to nearly the boundary of North Jutland. The country also, in respect to conformation and soil, is divisible into three tracts, each of which has received from nature a distinctly impressed individual character. In the centre lies a slightly elevated ridge of sandy heath, which runs up, rising higher as it goes north, to the furthest extremity of Jutland. It grows little corn except buckwheat and oats, and of these hardly sufficient for its own consumption, but it is of some value as pasture land. The western side of this tract slopes gradually to the sea, and terminates in a strip of deep rich marsh land, such as is found along the coast of the German Ocean from Holland to the north of Jutland. This territory may be regarded as the gift of the sea to the land. It has been formed of mud or slime, borne in solution by the waters of the ocean, and washed up on the long ranges of sandbanks which face the coast and are laid bare at low water. The considerable island of Sylt, off the coast of Schleswig, expresses its own origin in its name. The process of formation may be distinctly traced at any point of the shore, or indeed wherever the ground under the surface is exposed to view. The soil lies in layers or cakes, each of which is the deposit of a particular tide, and contains glittering particles of sand, or perhaps mica, which the natives insist have much to do in making it fruitful. The adhesive quality of the sea-slime makes it settle soon, and the process is aided by the frosts and ice of winter, which cover the sand with a coating of earthy matter. The viscous sediment forms a fine, deep, rich, but not heavy, blue clay or loam; it rises by degrees till but a few inches of water remain, and soon its surface is covered with aqueous or amphibious plants, rushes, couch grass, *salicornea herbacea*—or *queller* as it is here called—whose horizontally-shooting arms impede the action of the water, and become a sort of frame-work for earthy particles to collect upon and around. When white clover appears, the land is regarded as ready for cultivation. This process does not everywhere go on at a uniform rate, and it is materially accelerated by the ice-floods when they bring up much clay. There are places where the deposit hardly amounts to the depth of one foot in a half century; but in others it rises a foot in six or eight years. In consequence, the depth of the clay-soil varies from a few inches to 10 or 12 feet. Sometimes the clay-layers alternate with dark brown iron-tinted sand, mixed with shells, and sometimes the boring-rod ascertains the existence of mosses or bogs 20 or 30 feet deep at only half that depth below the surface of the ground, as in the Kremper and Wilster Marsh. The inhabitants assist the action of the waves by throwing out low dams, called *laanungs*, which run just under water, and which detain the silt brought by the water, and prevent it from being again carried out to sea by the ebb. Dykes are raised to protect the new soil against the violence of the waves, and as soon as a tract is formed sufficiently large to make it worth while, the dyke is commenced. Such a tract enclosed with a dyke is called a cog, and a succession of these cogs lie one behind the other. These dykes are now built 22 feet high over the sea level, steep on the land side, and sloping towards the sea, so as better to break the force of the waves and the ice flakes which the storms dash against them; they are often strongly faced with stone, and being from 12 to 18 feet broad at top, serve the purpose of highways. The old cog dykes, which were not more than 8 or 9 feet high, are left standing, and serve as an additional security against the effects of inundations, which often do much mischief. It will be seen that this system is essentially the same as the Dutch. The marsh land, which begins but a few miles west from Hamburgh, and stretches to Ribe in Schleswig, or even into Jutland, varies in breadth from one to ten miles; the older parts bear a considerable resemblance to the fens of Lincolnshire and Cambridgeshire. It is a subject of curious inquiry whence the sea obtains the earth which goes to the formation of this territory. Does it rob us of what it gives to our old fatherland? Certain it is that our geologists maintain that the whole east coast of Britain loses something every year by the inroads of the sea—and, indeed, any one who has been much about the coast must have remarked it for himself. The eastern side of Holstein and Schleswig wears by far the most picturesque and inviting aspect, and presents much more variety of surface than either of the other portions. The land is generally well adapted for either corn or the dairy. It is carefully enclosed with hedges in the English fashion, generally growing on banks, and here called *knicks*, so that the country wears a much more English look than most parts of the Continent, and even than the Danish islands generally. Here lies, from Flensburg to Eckernforde, a nook which still retains the name of Engelland or Angeln —an appellation which, though now restricted to a particular district, was formerly extended to the whole southern half of the Peninsula, and was transferred by the emigrant Saxons to the southern division of Britain. The eastern side of Holstein, from Eckernforde by Kiel and Plœn to Lubeck, is the fairest territory in the duchies. The rich meadows, the well-tilled corn lands, the spacious and substantial farmhouses and buildings, the neat and thoroughly clean towns—looking as pretty as brick, plaster, and paint can make them—all remind one of the most beautiful parts of England. The undulating surface rises just enough to take away any idea of monotony, and from every eminence you obtain a view of the expanse of the Baltic, its calm dark blue waters sparkling in the sun, and stretching up occasionally into the land in one of those beautiful *fiordes* or firths which form so enchanting a feature of Scandinavian landscape. Lakes and groves add to the charms of the scenery, and the wood-covered hills slope gently up from the shore of lake or sea. There is but one drawback to the pleasure of travelling here. The roads in Holstein are worse than in most other parts of the Danish dominions, and, with one or two exceptions, they are left in their natural state. The coach bumps and waggles in the deep sandy ruts; and even on the post-road between the important town of Kiel and the ancient and renowned city of Lubeck it is impossible to advance faster than 5 or 5½ miles an hour. A few miles of it, however, in the neighbourhood of the two towns in question, have been macadamized, and probably by this time the whole would have been so, but for the war which has raged at no great distance. In Denmark (West Jutland excepted), as well as in most parts of Germany, the macadamized road is now, and has been for some years, nearly as general as in England, so that the complaints with which the books of English tourists used to teem on this head are now quite antiquated. So backward, however, in this particular has this nook of Europe remained, divided as it is under so many different jurisdictions, that it is not ten years since the road from Hamburg itself to Lubeck has been macadamized.

The three natural divisions of the country which I have described have systems of husbandry which, with much in common, are marked each by its own peculiar practices, to which difference of soil and circumstances have given rise. In the marsh country the land is chiefly employed for growing corn and fattening cattle (of which large numbers are purchased from north Jutland, and from the farmers of the middle or heath tract) for the butcher. The oxen pastured on the rich natural grass attain a great size, and afford the excellent meat which, when slightly salted and smoked, is known as Hamburgh beef. The estates recruit their live stock by buying cattle of three years old from those parts of the country which are unfit for dairies, or where the management of these is not so profitable as the rearing of neat. In Ditmarsh, and other tracts where a good deal of corn is raised, the ordinary crops are estimated at from five to seven qrs. of wheat an acre (land is here measured by the *demat*, which is about one and one-third English acres), ten to twelve quarters of barley, twelve to fifteen quarters of oats, and six to eight quarters of rape seed. Half or more of the land is kept in pasture, and has not been broken up for a century or more.

The middle district of the country, called the *heiderücke*, or heath-ridge, is occupied by farmers whose chief business is cattle-breeding. From the want of rich pasture here the breed does not reach a good size, and the cattle, when about eighteen months old, are generally sold to the farmers of the marsh country, or of the districts where the herbage and winter food are plentiful and nutritious enough to enable them to attain a due size. Neither the wheat nor barley are cultivated to any extent here, and only on small portions of ground lying near the farm, and strongly manured, which are called the *haus-koppeln*, or house-crofts. The crops raised are buckwheat and rye or oats, and the course is generally—1, buckwheat; 2, rye; 3, oats or rye, with three or six years' grass following.

The eastern division of the two provinces bounded by the Baltic possesses greater variety of soil than either of the others, and is generally termed by the country people the *geest*, in contradistinction to the *marsch* or marsh land. The soil is a fine loam, so mixed in different parts with calcareous, clayey, or sandy earths, as to afford great variety, and to be appropriate either for corn, green crops, or temporary pasture. It is here that the great dairy farms are situated, which produce and export so large a quantity of butter. The old rotation of crops—called the *koppeln-wirthschaft*, from the *koppeln* or fields enclosed with ditches and live fences, or the *schlag-wirthschaft*, from the *schläge* or open fields in unenclosed districts—consisted in dividing the estate or farm into eleven portions, or *marks*, with the following shift:—1, fallow; 2, rape-seed; 3, wheat or rye; 4, barley; 5, oats; 6, oats, with clover and rye-grass; 7, clover to cut; 8—11, grass. Four corn crops in succession were, however, not found to answer, and the rotation adopted now-a-days is—1, fallow, with manure; 2, rape or wheat; 3, wheat or barley; 4, peas, vetches, and potatoes; 5, oats and rye; 6 and 7, clover and grass. A very intelligent gentleman, who possesses 300 acres of land in the neighbourhood of Preetze, described his practice to me as follows: Rather more than two-thirds of his estate is arable land—the remainder meadows, wood, and turf. Nearly half the arable land is fit for wheat. The fields are divided into fourteen chief closes of fifteen acres each, each inclosed with banks of mould planted with small wood, hazel, willow, or alder (these are the *knicks* already mentioned). There are also six other closes (*beischläge* or *nebenschläge*) of no determinate extent, which lie in pasture, and are only taken out of it occasionally to be strongly manured. The whole tillage ground was marled twenty years ago, with one load of marl (which is plentifully found in the eastern district of Holstein) to 220 square feet English. The rotation followed is—First year: Clean fallow. In the autumn preceding, the soil is broken up in narrow furrows, and in the following April it is turned over an inch deeper, being afterwards harrowed thoroughly. Manure is laid down in the beginning of June; twenty heavy loads to each *steuertonne* (1 3-10 English acres). The dung is ploughed in after being well dried; a cleansing harrow follows. In the early part of July the ground is cross-ploughed to the whole depth thought requisite, and it is afterwards harrowed a second time. When weeds spring up and threaten to ripen, the fallow is ploughed once more before sowing. The roller is used where the soil forms clods. Second year: Rape is sown if the soil is too luxuriant for wheat—otherwise, wheat or rye. For seed, 2 3-5 bushels of wheat and barley, and 2 9-10 of rye per acre are required. The average yield is twelve-fold. In spring the wheat is harrowed, and afterwards rolled, to loosen the ground after the frosts. The wheat fields are twice ploughed in autumn. Third year: Rape is followed by wheat, and wheat by barley, which also requires two ploughings during spring, the first about five inches deep, when the soil has been properly dried; afterwards it is harrowed. The ground is then sown, the barley is ploughed in as flat as possible, harrowed when the seed begins to come up, and afterwards a stone roller is passed over it lightly. In autumn, to bury the stubble, the ground is ploughed about four inches deeper than for sowing. Fourth year: Oats with clover. The oats are sown after one ploughing, 4 1-3 bushels to the acre. The yield is nine-fold. All summer corn is rolled, and the thistles are destroyed during the summer months. Fifth, sixth, and seventh years: Pasture. Eighth year: Oats and tares, for which the ground is ploughed about five inches deep in spring, then sown somewhat thickly, and strongly harrowed and rolled. When pods begin to form on the tares, they are mown and made into hay. This crop produces upwards of five loads on 3-10 acres. Immediately after cutting, the soil is ploughed and harrowed again, and manured a fortnight afterwards with 15½ loads of dung on an acre. It is then re-ploughed, harrowed, and rolled, to prepare it for the seed. Ninth year: Wheat or rye. The quantity of seed, preparation, and produce are often the same as after the clean fallow. The difference of yield as against this course is seldom more than 3 9-10 bushels to an acre. Tenth year: Barley, as in the third year. On light soil the produce is, however, about six bushels an acre less. Eleventh year: Oats, for which the soil is manured in winter with rather less than eight loads of dung on an acre. Clover—two-thirds red and one-third white—is also sown among this grain, or perennial rye-grass on light sandy soil. Twelfth, thirteenth, and fourteenth years: Pasture. The thistles which appear in summer are mown, and the droppings of the cattle dispersed over the ground. Seventy milk cows, besides neat cattle, and twenty sheep for the household, are kept on the estate. Four men-servants and a cow-herd are employed at board wages. The head servants receive £6 5s. annually, three others £4 10s., and the cow-herd £2 10s. There are besides five day labourers, who receive during harvest 10½d., in summer 8¾d., and in winter 7d. a-day, without board. Much piece-work, however, is done by contract, such as cleansing ditches, cutting grass from dams and mounds, cutting turf, marling, and other sorts of labour. Thrashing is paid in kind from the fourteenth or sixteenth to the eighteenth bushel.*

In travelling through the Duchies it is impossible not to be struck with the spacious and lofty buildings erected even on farms of moderate size, often much larger and handsomer than would be considered necessary, or at least than are generally found, in England. These are of course very expensive, and are always insured for their full value, which is calculated at one-third that of the land. In the Danish islands, and even in Jutland, the whole or the greater portion of the crop is stacked in the open air, even by the largest proprietors, as with us at home. The winters of Holstein, like those of North Germany generally, are more severe than in most parts of Denmark, and partly from this cause, or perhaps also from prejudice—for I found that they considered the stackyard a very contemptible expedient—the crops are always kept housed. It requires very roomy and capacious barns to hold the produce of even moderate farms, and the numerous large buildings attached to almost every farm which the traveller passes give the country quite an imposing look of wealth and plenty.

The dairy-farming of Holstein is celebrated for its excellence. It was originally derived from Holland, and the head manager of the dairy is still generally called the Holländer, though having no real claim to the appellation. The system has now been extended far beyond the limits of the province, and is little less general in Zealand and Fyen, and even some parts of Jutland, than in Holstein. It is impossible not to be struck with the admirable order and neatness which pervade the economy of these establishments, and with the nicety with which the operations are conducted, from the milking of the cows to the storing of the butter and packing it for export. The cows are milked in the fields during the fine season by the maid-servants, and the milk is brought to the farm on cars constructed for the purpose, the fabric of which consists of two long poles resting on wheels, from each of which hangs a row of large milk-pails. From these pails it is transferred to the milk-cellar, on the floors of which are ranged a goodly array of shallow vats, chiefly of wood painted red, in which the milk stands till the cream gathers. Every precaution is used to keep the milk-cellar dry, clean, and airy. The floor is neatly paved with tiles, and a row of arched windows immediately below the roof, which is fifteen or twenty feet high, allows admission to the air. When cream is taken from the milk it is necessary to look carefully after the weather, as a thunder-storm would sour it, and inflict serious loss on the farmer. The process of churning is performed by fanners, working in large square vats, generally made of iron tinned over, which are driven by horses, and sometimes by steam. On farms of 800 and 1,000 acres the number of cows kept is from 300 to 400, and 500 to 600 pounds of butter are produced daily in the season. The yield of summer butter from each cow is estimated at 106lbs., and the net yearly produce of ten cows comes to about £4. It has been remarked that cattle-farming, where the cattle can be kept (as on fine pasture lands) on the spontaneous produce of the soil, is attended with so little outlay, and commonly with so certain a gain, that no occupier of common judgment will be easily seduced from it into the hazardous pursuits of fallowing, ploughing, and sowing, if a clear gain, however small, can be secured by grazing. A large share of the Holstein and Danish butter is exported to England. Most of the dairy farms are on the east coast, but some are also to be found in the marsh country, where the dairy is regarded as a main object of attention. The produce can now be conveyed to Hamburg with great facility by the Holstein railway to Kiel and Glückstadt.

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* I found the rent of the better sorts of land to vary from 16s. to 25s. (English) an acre, according to the situation of the farm, the excellence of the soil, and the condition of the buildings and stock, which latter, here as in Denmark, generally goes with the soil. The same gentleman to whom I am indebted for the account given above, estimated the cost of production for wheat at 24s. to 25s. the quarter: for rye and barley, 17s. to 18s.; for oats, 9s. to 10s.

The same natural conformation prevails in Jutland as in the Duchies (the central tract being an elevated and generally sterile heath), but with greater general variety in the aspect of the country. It rises into gently sloping ridges, which succeed each other as regularly as the waves of the sea. In the south-eastern part these are often beautifully wooded, and interspersed with fresh-water lakes, or with arms of the sea stretching up into the land, whose calm waters for the greater part of the year are not more turbulent. For charming scenery of this description I do not know a more lovely country than that around Veile and Scanderburg. The prevailing tree is the beech, which, both in Jutland and the islands, almost excludes every other species of timber, except in new plantations. Often, as I looked on landscapes to which the graceful forms and bright cheerful green foliage of this tree gave a singular effect of sprightliness, I smiled to think of the long-stretching gloomy forests of pine and firs which had been associated with my ideas of Denmark. Further north, about Randers and Aalborg, the face of the country is much barer, and large districts occur which are nearly treeless. Its aspect, however, is far from unpleasing, for the careful cultivation of the corn land (and in the whole eastern portion of the country there is but little soil that is not available for cultivation), speaks of thrift and order, with their concomitants, comfort and plenty. The western coast, with its sand-hills and wastes of flying sand tossed by the rude winds of the North Sea, and its heaths and bogs, and rough sandy roads over which your carriage crawls at a snail's pace, is the most dreary and uninviting portion of Denmark. The billowy or ridgy formation to which I have alluded provides Jutland with an admirable system of natural drainage. The sandy soil absorbs a great quantity of moisture without injury, and heavy rain runs off the slopes almost as it might from the roof of a house. Artificial drainage in such a country as this is far from being of so much importance as with ourselves. It is but eighteen months since Jutland, as far north as Aarhuus, was in the possession of a foreign army; and wherever I went I found the memory of the German occupation fresh. Many of the proprietors and farmers with whom I conversed had seen their dwellings and farm-buildings occupied by Prussian infantry, and pointed out to me spots which had been the scenes of skirmishes between their own countrymen and the invading troops. The latter, however, seem to have been careful to avoid offence, as far as possible, in their dealings with the inhabitants; for I heard many praises of the good conduct and orderly discipline of the men, though the barbarous proposal of General Wrangel to levy a military contribution of 2,000,000 dollars on Jutland was not forgotten.

The following table exhibits, in a clearer light than any I have yet given, the comparative numbers of the yeomanry in Jutland and the islands. It is composed from the census taken in 1845:

	Islands.	Jutland.
Steadings (*steder*) from 8 to 12 ton hart-korn (80 to 120 acres)	2,937	1,202
" from 4 to 8 (40 to 80)	16,622	10,912
" from 2 to 4 (20 to 40)	5,196	14,302
" from 1 to 2 (10 to 20)	5,067	9,991
" under 1 ton, or 10 acres	58,951	67,875
	88,773	104,282

The farm-buildings in Jutland, except upon large estates, have not the same spacious and stately look as in Holstein. The Danish farm-steadings are almost uniformly built in the form of a square—a fashion which has descended from the time of the old Scandinavians, whose principle it was to construct their habitations towards the four cardinal points or quarters of the heavens. One side is occupied by the dwelling-house, generally with one or two hinds' houses attached; the other two by the stable, cowhouse, and sheep-stall; the fourth by a barn. At the back is generally a kitchen-garden, with fruit-trees and flowers. The stack-yard, filled with stacks, which have generally a much more ragged and untidy appearance than those of English build, stands at the side. The whole is surrounded by a rough-stone wall, the materials for which have generally been obtained from the granite boulders once plentifully scattered over the surface of Denmark, most of which have now been removed and broken up for roads and buildings. In barren and thinly-peopled districts these homesteads have much the look of islands in the midst of a sea of corn or pasture. Long, low, and narrow, with whitewashed walls and thatched roofs, they exactly resemble the old style in which the Scottish farm-houses used to be built. The court-yard inside generally contains a heap of manure from the byres. In the homesteads of large farms of modern erection, the square form is only adopted when it happens to be the most convenient for the locality; but both single homesteads, and hamlets containing perhaps twenty different farm-houses, of older date, are always laid out strictly on a quadrangular plan. There is slovenliness enough observable both outside and in the cattle-houses; the buildings, too, have stood the storms of a century or two in most cases, and wear not unfrequently a rather ricketty look. Inside you will find plenty to eat and drink, and a rude but not uncomfortable style of housekeeping. The rooms consist of a sitting-room—sometimes also answering the purposes of a bedroom—one or two sleeping-rooms, and a kitchen. The deal floor is sanded, but rarely or never carpeted. The more substantial class of small proprietors, possessing from two to three hundred acres of land, furnish their houses with as much elegance as people of the corresponding rank in England. Carpets, a few books, and musical instruments are found in them; and your host will produce you a bottle of capital claret, which does not cost so much here as at home. In the cottages of the labouring peasantry of Denmark the loom, in which the linen and woollen stuffs for household use are woven, is very general, and gives an air of comfort and domestic industry which is in the highest degree pleasing.

The aspect of the Danish islands bears a general resemblance to that of Jutland. The formation of the country is much less regular, the elevations being more abrupt, and extended levels, called *sletts*, which are generally fine meadow land, being common. The wood is by no means equally distributed, some parts being as finely wooded as any English district, others comparatively bare. There are but few old and large trees, except in the royal parks and the grounds attached to the seats of the nobility. Wood is here an article more of profit than ornament, and the sale of it for fuel or other purposes forms an important item in the income of most landed proprietors. Green slopes, smiling corn-fields and pastures, with alternations of hill and dale, make a pleasant if not very striking landscape; and near the coast, the fiords running up into the country with all manner of strange serpentine windings are a never-failing source of pleasure to the eye.

There is little that is remarkable in the costume of the Danish peasantry. The almost-universal dress of the men is a close jacket, and breeches of coarse light blue woollens; that of the women a gray woollen gown, with a rock or hood of the same, which on Sundays and holidays is exchanged for cottons and silk of a gayer colour.

The want of fences in most districts (Fyen, however, and some parts of Zealand, are as much enclosed as any parts of England) gives the country at first somewhat a bleak appearance. There is no point perhaps as to which agricultural opinion is more divided than as to the advantage or disadvantage of fences. If they shelter the ground from wind, on the other hand they attract and retain moisture, deaden the sun's heat, and impede the circulation of air. It is very questionable if the plan of leaving the ground to the free action of the elements, in districts which are not exposed to constant and violent winds, is not the better one; and I believe the balance of opinion amongst farmers now inclines to this side.

I visited several of the large estates in the islands, and was everywhere received with a kind and unaffected hospitality which I shall always remember with pleasure. To Baron Adler, of Adlersborg—the proprietor of the feudal stronghold in which Bothwell, the husband of Mary of Scotland, expiated his misdeeds by a confinement of sixteen years—I am particularly indebted for the trouble he took in giving me all the information I wished to procure as to the details of rural economy. This nobleman, who is one of the most zealous and intelligent agriculturists in Denmark, had the misfortune, two years ago, to lose his farm-buildings and from two to three hundred head of horses and cattle by fire. He has rebuilt them in the most spacious and solid style, taking every precaution against the recurrence of a similar calamity. His dairy-house and cattle-stalls, provided with every convenience for ventilation and cleanliness, have been constructed from the plans of Mr. Jörgensen, one of the most able theoretical agriculturists of Denmark, aided by his own practical skill and experience. They appeared to me models of rural architecture. The baron's estate consists of 14,000 acres of arable land, besides 1,200 of woodland. There are 150 farms on it, varying in size from 40 to 200 acres, which are let out on lease, besides one of 1,500, and another of 500, which are in the occupation of the proprietor himself. Besides farm-buildings, there are 295 workmen's houses on the estate, 25 of which are occupied by hinds or ploughmen employed on the main farm; 88 are without any land but a garden plot; the others have from three to four acres annexed to them. On the farm of Adlersborg itself there are about 400 acres of permanent grass land, and 1,100 under tillage; 300 milk cows are kept in summer, and 350 in winter, besides young stock, and 100 sheep (of the Dishley breed), with 40 plough horses. The land is cultivated with an eight course shift of—1, fallow; 2, wheat or rye; 3, barley; 4, peas and oats; 5, oats and rye; 6, 7, and 8, clover and grass. The crop, which this year is an average one, yields in the whole 550 quarters of wheat, 300 rye, 1,150 barley, 750 oats, and 300 peas, with 500 to 600 loads of hay, of 9 cwt. each. Of the above quantities, deducting what is used on the farm, for the household, and for cattle feeding, there are available for sale 500 quarters of wheat, 200 rye, 1,000 barley, and 250 oats. The return, on the average, is 39 to 40 bushels of wheat, 35 of rye (but for this grain the soil is not well adapted), 56 to 60 bushels of barley, 48 of oats, and 32 of peas. The milk cows yield on an average 80lbs. of butter, which is considerably less than the yield of the Holstein breed. The soil is of a fair or middling quality, well cultivated. The other farm has 400 merino sheep on it.

There are but few estates in Denmark on which sheep-farming is carried on upon a great scale. One of these is that of Count Lertke, of Lertkeborg, one of the largest farmers in Denmark, who has attained a patriarchal age in the pursuit of agriculture. The Count's estate was in very bad order when it came into his hands; but his management of it, which has now lasted 60 years, has made it one of the most flourishing in Denmark. He holds in his own hands seven large farms of from 500 to 1,000 acres, having of course a bailiff or overseer to each. Some of them yield excellent corn crops, especially of barley, but there is much light soil on them, and the pasture is not sufficiently strong for large cattle. They are stocked with Merino sheep, of which there are 8,000. The produce of this large number does not amount to more than 14,000 lbs. of wool yearly, the fleece of the merino not yielding more than 2lbs. Merino wool in Denmark brings 4 marks 8 skillings, or 20d. English, per lb. The Merino breed was introduced from Spain towards the close of the last century by King Christian VII. I confess I was disagreeably surprised by the appearance of this breed, which I had pictured to myself as one of a very stately, or at least graceful and elegant character. Instead of this it is small, lean, and scraggy (the flesh is of very little value), with a dirty-looking and tangled fleece. Count Lertke's sheep-stalls and barns are beautifully built, and of immense size, arranged on the old Danish quadrangular plan. I was informed that some of them had been erected so long back as 1750-60, which would seem to show that the agriculture of Denmark could not have been at that period in so miserable a state as is generally supposed. The mansion-house of Lertkeborg is in the style of Louis XIV.'s time, and was built in the beginning of the last century. It is an elegant structure, and the gardens and grounds are laid out with great taste. I was never tired of admiring the vast proportions of the barns and storehouses, which (besides a well-filled stack-yard) were bursting with grain, or of listening to the music of the threshing-mill, which was in active operation. Newcastle coal being much cheaper in Denmark than in London (strange that it should be so!) it might be of advantage on some of the large Danish farms to have steam-driven machines, especially when there are two or more in the same hands, but I did not meet with them in any instance.

I remarked, in a former letter, that the export of wool from Denmark was steadily and rapidly increasing. The import of this article into England is far from trifling, though bearing but an inconsiderable proportion to the amount of our consumption, or to the supply we draw from our Australian colonies, and from Germany and Russia. In 1845 we actually received from Denmark a larger supply of the article than from Spain—the quantity brought from the former country being 1,330,745lbs., and from the latter only 1,074,540 lbs. In 1835 our imports from Denmark were only 366,469lbs., and in 1840 605,521lbs., so that the export to this country nearly trebled itself in ten years.

AGRICULTURAL STATISTICS.

In the many important agricultural meetings recorded in our pages during the parliamentary recess, the proceedings at which we have seen fraught with facts and arguments completely subversive of free-trade dogmas, it has often struck us that one essential topic in connexion with the stability of British agriculture has not been kept so prominently in view as we were wont to observe in the frequent discussions that took place at farmers' clubs and in the rural districts in 1847-8. We allude to the expediency of an official provision for the annual collection of information relative to the amount of land under cultivation in the United Kingdom, the several kinds of produce raised therefrom, and the number of cattle, sheep, and other animals, kept thereon. All other countries noted for their agricultural capabilities have their periodical record of these appreciable data, and consequently furnish that benefit to both producers and consumers which a well-regulated system of agricultural statistics cannot fail to ensure. We sincerely hope to witness, in the ensuing session, the re-introduction of some such measure as that which was brought forward a session or two since by Mr. Milner Gibson, and that it may receive a larger quantum of support than was accorded to the bill of 1847. If, however, there be any waverers among our legislators upon a subject of such vital interest to the entire community of these realms, we believe we cannot direct them to a better source for acquiring a decided judgment than by consulting the edifying pages of a pamphlet written by Mr. Fleming a short time since, in which not only is the question of agricultural statistics dealt with in a most conclusive manner, but other points of a practical character, involving many valuable suggestions for increasing the agricultural produce of the kingdom, will be found to supply hints to the British farmer, which the oldest cultivator need not hesitate to adopt. The remittance of ten postage stamps will, we understand, secure the free transmission of this well-considered pamphlet, if addressed to Mr. White, 13 Gower Place, Euston Square, London.

We learn from the following communication, which appears in *L'Echo Agricole*, a French agricultural journal, that services valuable to agriculture are in France regarded as deserving of honourable distinction equally with the professions, the sciences, or the arts.

> "By a decree issued by the President of the Republic, at the suggestion of the Minister of Agriculture and Commerce, dated the 10th of Dec., 1850, the following persons have had the order of the Legion of Honour conferred upon them:—
>
> M.M. Dawzat, a Member of the General Council of the High Pyrenees during a period of sixteen years, in consideration of services rendered to agriculture.
>
> Darblay, Jr., Member of the Council of the Department of Corbeil, for the remarkable impulse he has given to the grain trade, and to the manufacture of flour.
>
> Gareau, as a reward for the remarkable progress he has caused to be made in the art of drainage, and the zeal he has shown in extending the practice of it in France.
>
> Graux, of Mauchamp, farmer, for services rendered in sheep-breeding, by improving the fine-woolled Merinos sheep of Mauchamp.
>
> Lemarié, of Toufreville, for his useful agricultural works, and the remarkable improvement which he has caused to be made in the breeding of cattle.
>
> W. Lecocq, a landed proprietor of Clermont Ferrand.
>
> Perrin, of Bénévent, President of the Association of Vaugneray, for having materially contributed to the advancement of agriculture in the department of the Rhone.
>
> "We cannot but applaud the act of justice," says *L'Echo Agricole*, "by which the Government has just admitted into the ranks of the Legion of Honour a certain number of eminent men who have rendered services to their country as agriculturists and as commercial men. There is not one of those whose names we have just given, who does not merit in the highest degree the reward awarded to him. We should not have particularized any one, if the appointment of M. Darblay, Jr., and the motives on which the *Moniteur* relies, did not appear to us sufficient to call for a particular observation. Already a certain number of farmers have received the decoration of the Legion of Honour, but up to the present time we have not seen it conferred for services rendered as a corn-merchant and flour-manufacturer. Decorations have been lavished upon almost every species of manufacture and commerce—cloth, calicos, silks, &c.; but the trade and manufacture which affect in the highest degree the grower and consumer of agricultural produce have been buried in oblivion. This omission, it must

be admitted, was an injustice founded upon prejudice. The high reward given to M. Darblay is a beginning of reparation; it will be an encouragement to all those who far or wide follow M. Darblay in the career he has run, and which he still runs with so much honour and ability. It is at the same time an indication that the prejudice against the grain and flour trade is disappearing in the administrative department: it is by such acts that a salutary influence is produced on public opinion, and that fatal errors are dispersed. The reward, regarded in this point of view, is alike honourable to the citizen who has received it, and to the minister by whose recommendation it has been given (A. Pommier)."

METEOROLOGICAL DIARY.

Barometer.			Thermometer.			Wind and State.		Atmosphere.			Weath.
Day.	9 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	9 a. m.	2 p.m.	10p.m.	
	in. cts.	in. cts.									
Nov.21	29.44	29.70	44	46	42	North	gentle	cloudy	cloudy	cloudy	dry
22	29.67	29.48	39	53	53	S. West	lively	cloudy	fine	fine	rain
23	29.38	29.60	43	48	45	S. West	lively	cloudy	cloudy	cloudy	rain
24	29.37	29.05	44	54	48	S. S. by W.	violent	cloudy	cloudy	cloudy	rain
25	29.08	29.22	44	51	41	Westerly	variab.	cloudy	fine	fine	rain
26	29.35	29.44	38	43	41	South	variab.	cloudy	cloudy	cloudy	rain
27	29.55	29.90	38	42	38	North	gentle	cloudy	cloudy	fine	rain
28	30.16	30.30	32	41	31	Easterly	calm	cloudy	sun	fine	dry
29	30.30	30.25	29	42	29	E. by South	gentle	fine	sun	fine	dry
30	30.15	30.10	28	34	34	S. Easterly	gentle	fine	cloudy	cloudy	dry
Dec. 1	30.09	30.22	34	36	36	E. by South	calm	cloudy	cloudy	cloudy	rain
2	30.22	30.23	35	43	40	S. S. by E.	gentle	cloudy	cloudy	cloudy	dry
3	30.20	30.10	37	40	38	S. S. by West	gentle	cloudy	cloudy	cloudy	dry
4	30.06	30.16	36	47	46	S. West	lively	fine	cloudy	cloudy	rain
5	30.22	30.33	45	52	46	S. West	gentle	cloudy	sun	fine	dry
6	30.38	30.38	36	46	44	W.byN., S.W.	calm	fine	sun	cloudy	moist
7	30.39	30.32	37	48	37	E. by N. or S.	calm	fine	sun	fine	dry
8	30.32	30.32	36	38	36	N. East	calm	haze	haze	cloudy	damp
9	30.32	30.30	30	36	36	E. by South	calm	haze	haze	haze	damp
10	30.25	30.15	30	35	32	S. East	calm	haze	haze	haze	damp
11	30.04	29.94	32	40	40	S. West	gentle	cloudy	cloudy	cloudy	dry
12	29.94	29.96	40	48	40	S. West	gentle	cloudy	cloudy	fine	rain
13	29.89	29.80	40	47	47	S. West	lively	cloudy	cloudy	cloudy	dry
14	29.75	29.45	42	48	45	S. West	brisk	cloudy	cloudy	fine	rain
15	29.46	28.98	39	54	54	S. West	strong	cloudy	cloudy	cloudy	rain
16	29.29	29.10	42	44	43	S. West	strong	fine	sun	fine	rain
17	29.29	29.40	39	53	34	S. West	brisk	cloudy	cloudy	fine	dry
18	29.36	29.20	32	40	37	S.W., S. by W.	brisk	fine	sun	cloudy	rain
19	29.19	29.80	34	39	33	N. by East	calm	fine	cloudy	fine	sleet
20	30.04	30.24	31	35	30	N. by W.	gentle	haze	sun	fine	dry

ESTIMATED AVERAGES OF DECEMBER.

Barometer.		Thermometer.		
High.	Low.	High.	Low	Mean.
30.32	29.120	55	17	39.3

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
43.76	36.86	40.31

Weather and Phenomena.

Nov. 21—Some fine gleams. 22—Much small rain. 23—Wet forenoon. 24—Storm, wind, and rain; fine evening. 25—Fierce wind, and shower. 26—Overcast; some rain. 27—More small rain. 28—Hoar frost; drying air. 29—Similarly fine weather. 30—Gloomy; frost going.

Lunation.—Last quarter, 26th day, 32 min. afternoon.

Dec. 1—Cold; overcast. 2—Evening clear. 3—Overcast. 4—Red streaky sunrise; rainy noon. 5—Very warm sun; close till evening. 6—Clear morn; nearly frosty-hazy afternoon. 7—Strong dew; fine. 8—Heavy, damp, haze. 9—Same. 10—More dense. 11—Changeable; overcast. 12—Much early rain. 13—Overcast. 14 and 15—Strong wind; showers; much rain. 16—Sunny forenoon; wet afternoon. 17—Some showers; cold wind; fine night. 18—Fine pleasant day. 19—Fine till two, then cold sleet; shower flakes of snow for a few minutes. 20—Decided frost; lively air.

Lunations.—New moon, 3rd day, 5h. 16m. afternoon. First quarter, 11th day, 8 h. 37 m. afternoon. Full moon, 19th day, 5 h. 3 m., morn.

Remarks referring to Agriculture.—The weather, after the fine periods commencing the 28th of November, and continuing till the 11th of December, has been succeeded by weather of a very different character—wet, and often violently windy. The balance has thus been considerably restored. The generally low temperature of the night has kept the young corn in a subdued condition. The turnips still remain abundant and green, and the prospect is promising. J. Towers,

Croydon.

CALENDAR OF HORTICULTURE.—JANUARY.

The usual retrospect is postponed till the closing paragraph. The weather has become quite unsettled, and at times violent: a change may in a short time be anticipated, and for the present the supply of water appears to have been ample; by some calculations it is stated to have amounted to 1·39 inches in the four days from 24th to 27th November inclusive—and subsequently every one knows a great bulk has fallen—as the Meteorological Table will testify.

VEGETABLE DEPARTMENT.

The operations, as I have often stated, must be contingent; because, if the ground be locked up by frost, no tool can act upon it. Yet a gardener need not lie by inactive. Reserved heaps of manure should be moved in the barrow, and deposited on vacant spots, or laid in the trenches between ridges, where such exist. Some waste by evaporation and the extrication of gas will be thus occasioned, but not to any extent equal to that which takes place in the hot dunghill; and now—thanks to discovery—we are warranted in stating that every drop of manuring matter which filtrates from a heap, and each solid particle of it that is dragged into the soil by the earth-worm, is seized and appropriated by that laborating medium.

If, on the contrary, the ground is soaked with water, so as to become cloddy or pashy if worked by any tool, it should neither be moved nor compressed, otherwise its vegetative power will be injured. Nature is its own best corrector; and one night of keen frost, succeeded by a drying wind, will do more to meliorate the texture than all the exertions of man; and assuredly, if patience be allowed its perfect work, it will soon be perceived that "there is a time for all things." Thus, premising a fact that experience confirms, the contemplated operations of January, at suitable, open periods, will consist in sowing any favourite varieties of *early peas*—pretty close in the drills—covered with chopped furze. Among such peas, I have lately found highly recommended—"*Isherwood's Railway*, *Warner's Emperor*, and *Fairbeard's Early Surprise*." Long pod *beans* are also to be sown. Peas are forwarded, and the seed secured, by sowing in long shallow boxes, with one fall-down side, or in a grooved channel, cut triangularly along the centres of reversed yard-long green turves, the seeds covered with earth; for by such means they can be excited in frames, and removed, entire, in lengths to the open ground. A method of guarding peas from mice has been suggested, which perhaps deserves notice, and may succeed. A flat piece of firm ground, that has not been disturbed, is sown row by row; the first is to be covered by spits of earth, inverted as each is raised by the spade, and the work proceeds thus till every row is completed. In much the same way, but operating upon green turf, the Irishman plants his "lazy-bed" of potatoes. The writer inferred the safety of his rows of peas, thus unceremoniously confided to deeply turned spits of earth, from the ignorance of the mice; but, query, would not instinct direct the animal to its prey?

Cabbage Plants.—Set out more of these from the nurse-beds, to succeed the crops of autumn. Hoe about the rows and stems of all the *brassicas*, in fine weather; and when the ground is free to the hoe, sow several kinds of *lettuce—brown Dutch*, *green cabbage*, and *cos*, and the *capuchin*. Double or curled *parsley-seed*, for transplanting, *horn-carrots*, *onions*, if designed to produce large bulb, are now sown. Force the early *red rhubarb* and *sea-kail* in pits, or a warm dark cellar; but, in that case, the plants should have been prepared in large pots or tubs.

Continue to trench, double dig, and ridge vacant ground, introducing recent dung deeply, and the more decayed black manure amongst the surface soil. The three or four tined, and the powerful Kentish fork, are capital tools at this season.

HARDY FRUIT DEPARTMENT.

Where tree-planting remains to be done, the ground ought to have been, or must now be, prepared for the work at the earliest opportunity. Trenching and setting up ridges are excellent meliorators; but one important operation should be thought of, and that consists in preparing a sort of impenetrable foundation, like thick slates, or broad tiles, set with cement, that will prevent the roots from tapping into the subsoil. The places where fruit-trees are to stand being determined, this paving should be placed so deep only as to permit the roots to be expanded *horizontally* about six or eight inches below the surface of the soil; a circle of four feet in breadth would secure that direction which, once acquired, would in general be retained. It might be better to pave or concrete to the extent of an entire fruit border; but expense must be considered by the many. In any case, no dung will be required at this period of preparation. Mulching, at the time of planting, upon the surface, over and beyond the space occupied by the roots, will afford protection, and enable the soil, at the same time, to absorb gradually all the elements of manure which it may require.

Pruning of trees should be deferred, but that of berry-bearing shrubs can be proceeded with in the first open weather after frost. It will be superfluous to again describe the method adapted to the fruit-bearing habit of each species; but, after pruning, the gardener might select some fine cuttings of the best sorts of the *currant* and *gooseberry* to plant for young stock in a nursery bed. He should then manure the whole surface of the ground with two inches of reduced dung, if the trees stand in rows on a plot, or around the space occupied by the roots of individuals. If, as is too often the case, the gooseberries suffer from the caterpillar of the saw-fly, something must be done. I have tried several schemes to destroy this pest, whose attacks are often equally sudden and unexpected; but every attempt failed, to a certain extent, after the eggs on the young leaves had yielded the brood. The full-fed and matured grub (*larva*) undergoes its changes below the surface of the ground, perhaps three or more inches deep. This had long ago suggested a remedy, by an application of hot-lime to such a depth as to scald and destroy the grub. Just at this time I met with a method of applying lime, which the writer (Mr. Cole, gardener to The Earl of Abergavenny), communicated to the *Gardener's Magazine of Botany, &c.*, 1850, *p.* 11. "My mode," he says, "is this. In the autumn or winter, at the time of digging between the bushes, I have fresh-slaked lime sown over the whole of the ground, with a liberal hand, more particularly round the stems and about the roots of the bushes. The ground is then forked over. About the middle or latter end of March I have some more fresh lime sown about the roots and stems; the ground is then raked. In about a fortnight or three weeks this liming is repeated, and I then feel perfectly safe from the attacks of caterpillers. The remedy is very simple, very easily applied, and I have no doubt others will find it quite as effectual as I have done."

Grape Vines.—If these have not been pruned already (a great and injurious neglect), they should be finished off directly, according to former directions.

Early Vinery.

The notice taken of vines in the last calendar will obviate the need of many further remarks at this time. Days have turned; solar power increases, and the earliest house already started should permit an advance of ten degs by night; the border, whether inside or on the outside of the house, ought, if possible, to be kept at 60 degrees minimum; and this can only be done by the aid of dry coverings, put on in time, as before urged.

Strawberries in pits.—I have known those persons who have produced vast quantities of fruit, and obtained handsome returns of money with very trifling expense, and comparatively little labour, by thus planting "*Keen's Seedlings*," at regular distances, in good free-working loam, enriched with "*linings manure;*" that is, with the half-decayed product of the mixture of hot stable-dung and tree-leaves, which is used to heat the pine pits during the winter. Strawberry plants, in 32 and 24 size pots, require much attention and a renewed supply to keep up any succession between the middle of March and the end of May. Those persons who can be contented with fine fruit produced throughout April and May may effect their object by a range of four pits, the lights sloping at a moderate angle—say about 15 degrees from the base line, which is equal to 75 degrees by the perpendicular, according to the French mode of describing the angle. The walls of such pits ought to be of 9-inch brickwork, and sufficiently high at the back (say two feet, to fall to one foot in front) to admit of a good lining as a defence against severe spring frost. A small hot-water apparatus—if it could be afforded—prepared so as to heat one, two, or all the pits, at the discretion of the operator, would complete the efficiency of the erections for many purposes which it is my object to describe at their proper seasons. It now only remains to say that the ground inside the pits should be so deeply excavated as to admit of a foot or more of coarse drainage materials, broken bricks, stone chips, and the like, which would be advantageously covered with six inches of coarsely bruised charcoal, and over that an equal quantity of decaying leaves and twigs. The soil should be a foot in depth, after settling; and the plant ought to stand pretty near the glass, to insure the setting of the fruit and the free circulation of air. Strawberry plants, raised in small pots, from the first runners of July, ought, of course, to be ready, and these must be yearly renewed.

Final Retrospect of the Month.

After fogs, frequent changes of wind, rain, in showers, and more continuously, the wind veered to north east on the 19th, the weather became cold, and a scale of ice formed. The forenoon was fine and sunny; but a brisk sleet shower, ending with cold rain, followed in the afternoon. At this moment, frost, with a north-by-west wind, continues, and may perhaps settle for a time, with the full moon and winter solstice nearly coincident. To this date there is plenty of produce; the market gardens abound. Apples may be the dearest fruit of the season; but, in all the commodities of the period, my long memory cannot retrace any festive season which could compete with that we now approach. Surely our favoured land ought to resound with thankfulness. J. Towers.

Croydon, Dec. 20.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR DECEMBER.

The continued depression in the value of agricultural produce all over the kingdom, the prostrated condition of the agriculturists, and the great drain of our metallic resources in settlement of foreign balances, have formed the subject of deep and anxious solicitude during the whole of the month. That free trade is producing absolute ruin among our farmers, and exercising a most baneful influence even amongst the monied classes, is evident from what is passing around us. The freedom given to imports has resulted in a national loss of nearly £8,000,000 sterling in the precious metals within less than twelve months, as it has been ascertained that that amount of money has been actually forwarded to the Continent in the period just alluded to, in payment for French flour and other commodities! The result is that the Bank of England, fearing the worst consequences, has been compelled to raise the rate of discount from 2½ to 3 per cent. per annum. We may assume, however, that matters will not rest here; and further, that so far from any falling off in them, we shall have a considerable increase in the supplies of flour from France and elsewhere, as the French government, in order to encourage exports, has given permission to the millers to grind foreign wheat, and ship it in a manufactured state free of duty! It is very natural that every country should foster its own industry; and hence, it would be superfluous for us to dwell upon the injustice of a system which, as admitted in England, is calculated to destroy the interest and property of a most important body of men.

Although we have had a few sharp frosts, the weather during the greater portion of this month has been comparatively mild. From most counties, our accounts respecting the general appearance of the wheat plants are very favourable, yet they stand somewhat in need of a higher temperature, with a few falls of snow to check premature growth. Most of the growers, particularly those in the midland districts, state that the produce of wheat this season has greatly disappointed them. On threshing, the yield falls considerably short of expectation. That of barley is also represented as deficient; whilst the supply of all other spring corn is represented as small. Our opinion has therefore gained ground in some quarters, that, as the navigation up the Baltic is now nearly closed, higher prices for most articles will be obtained during the next two or three months. We trust that this prediction will be realized; but we regret to be compelled to admit that we see no reasonable prospect of any permanent advance so long as present laws regulate the importation of grain. Suppose, for instance, that we have a present deficiency in the stock of wheat, compared with that at the corresponding period last year, of 5,000,000 quarters, what difficulty would there be on the part of the foreigner supplying us with that amount of grain, or even a much larger supply, were it required? None whatever! Prices may fluctuate; but the slightest rise here would only be productive of increased supplies from abroad.

The fat stock markets have been in a state of depression without a parallel. The show of beasts in Smithfield on the great day was unusually large; but prices were ruinously low, and immense numbers were driven away unsold. This, then, is another result of free trade admitting foreign stock free of duty! Throughout the provinces the same state of trade has prevailed, and the general quotations have ruled fully 20 per cent. lower than the worst period on record.

It is gratifying to observe that the potato-crop has proved a most excellent one, not only in England, but also in Ireland and Scotland. The losses from disease have been smaller than for a series of years past; and we understand that the quantity on hand is sufficiently large for consumption for at least two months hence. The absence of any supplies worthy of notice from abroad has enabled the growers to realize fair prices; and it is thought that the total imports from Holland and elsewhere will exhibit a great falling-off compared with some former seasons. Since the first of August the imports into London alone have fallen short of those in 1849 during the same period by nearly 20,000 tons; but this appears to have been caused by the heavy shipments made during the months of June, July, and August, and which are stated to have left a serious loss to the growers. The highest price of the best Yorkshire Regents in the Borough market has been £5 per ton, whilst the total importation from the continent has not exceeded 500 tons. No improvement has taken place in the demand for hay and straw, which have sold at very low prices. The supplies offering have been on the increase. For hops, the trade has ruled heavy, and the quotations have given way to some extent, owing to the large quantities offering. The close of the public sales of colonial wool was marked with considerable firmness. The advance obtained during their progress was quite 2d. per lb. on the average. There has been some inquiry for British wool for shipment to France, Holland, and Belgium, and prices have improved fully one halfpenny per lb. The stocks of colonial now in London are under 10,000 bales; whilst those in the manufacturing districts are much smaller than usual. The next sales—which will take place in February next—will, it is fully expected, show a further considerable rise in the value of most kinds, particularly those suited to our clothiers.

In Ireland and Scotland the corn trade has ruled equally dull as in England. In the general quotations, however, no material change has been reported. Several somewhat large shipments of oats have taken place to London, and which have mostly arrived in good condition.

The turnip and beet crops are turning out extremely good. Fatting stock, as food is very abundant, is therefore doing well. The losses by disease have, however, been on the increase.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

As we have elsewhere referred at length to the holding of the great Christmas market in Smithfield, it would be superfluous for us to dwell here upon the exhibition of stock on that occasion; yet we feel bound to notice the serious losses sustained by most, if not the whole, of the leading graziers who forwarded the bulk of the bullock droves. It is calculated that the best breeds were disposed of at an actual loss of from 20 to 25 per cent. upon the cost of production, and that even a greater sacrifice was submitted to in the secondary qualities. The large numbers of stock from abroad, and the immense receipts of country-killed meat up to Newgate and Leadenhall—little short of 60,000 carcasses—tended, of course, greatly to depress the trade, which was unquestionably the dullest and most unsatisfactory on record. The show in Baker Street has, of course, attracted much attention, and competent judges affirm that, number and quality considered, it stood unequalled. From the general appearance of the stock, we have arrived at the conclusion that the consumption of oilcake has materially fallen off; indeed, the state of the demand for that article fully justifies the conclusion.

The total supplies exhibited in Smithfield have been as follows :—

	Head.
Beasts	24,239
Cows	316
Sheep	99,944
Calves	1,864
Pigs	2,619

COMPARISON OF SUPPLIES.

	Dec. 1846.		Dec. 1847.		Dec. 1848.		Dec. 1849.
Beasts..	19,639	,,	18,978	,,	19,016	,,	23,853
Cows ..	520	,,	500	,,	490	,,	442
Sheep..	108,610	,,	101,720	,,	87,240	,,	119,180
Calves..	1,096	,,	1,240	,,	1,113	,,	1,413
Pigs....	2,150	,,	2,765	,,	1,549	,,	2,139

The average prices have ruled thus :—

Per 8 lbs. to sink the offals.

	s.	d.		s.	d.
Beef ....from	2	8	to	4	0
Mutton	2	6	to	4	2
Veal	2	6	to	3	6
Pork	2	8	to	4	0

COMPARISON OF PRICES.

	Dec., 1846.						Dec., 1847.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, ...from	2	10	to	4	6	..	3	6	to	5	10
Mutton	3	8	to	5	2	..	3	8	to	5	4
Veal	3	8	to	4	8	..	3	8	to	4	10
Pork	3	6	to	4	10	..	3	6	to	5	2

	Dec., 1848.						Dec., 1849.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, ...from	3	4	to	4	6	..	3	4	to	4	6
Mutton	3	8	to	5	0	..	3	6	to	4	6
Veal	3	10	to	4	10	..	3	2	to	4	0
Pork	3	8	to	4	8	..	3	4	to	4	2

Notwithstanding that the Navigation abroad is partially closed, the following supplies of foreign stock have come to hand in London :—

	Head.
Beasts	3,721
Sheep	14,793
Calves	1,530
Pigs	391
Total	20,435
Same month in 1849	16,368
Same month in 1848	12,346
Same month in 1847	11,028

At the outports the receipts have been small, or about 2,000 head.

Newgate and Leadenhall have been heavily supplied with all kinds of meat, and the exhibition of poultry, &c., has greatly exceeded the demand. Notwithstanding that a very extensive business has been transacted, prices have ruled very low.

NORTH NORTHUMBERLAND.

As the season advances we receive daily proof of the shortness of the yield of grain, when prepared for the bushel on the barn-floor, which, with the low prices obtainable in our markets, makes it a very difficult matter for the farmer to meet his cash payments. Wheat and barley are, notwithstanding, generally of very fine quality, and weigh well on the scale. Oats are of good colour, but many samples are thin and skinny. Beans and peas are very good in quality, but the quantity very various. Having seen samples from all parts of the county, and had affirmations from most respectable parties, we venture to assert that, as a whole, we shall fall far short of an average quantity from crop 1850. After the dark days of November, we have had a week or two very fine December weather, and the young wheats are looking most beautiful, and large breadths are still being sown where turnips have been removed. Except two or three frosty days, field labour has progressed regularly, and all out-door work is in a forward state, with the exception of where the "farm is to let;" and we are sorry to record that in many localities it is like a *parish to let;* and there all is a chaos of confusion, neither ploughing of fallow nor preparation of manure. A few owners, and more enlightened land-agents, have adopted the praiseworthy principle of allowing the outgoing tenant to work up the fallows, cart out manure, &c., the entering tenant paying a reasonable compensation; but this unfortunately is the exception, not the rule. The turnip crop has continued to improve, and is much better than was expected in the early autumn. Cattle and sheep are doing well, where not attacked by disease; which on many farms has caused a serious drawback. At the very low prices which store cattle and sheep were purchased in autumn, the feeder will be sure of *some pay* this season; although our prices for fat are far from encouraging. The primest fed beef presented for sale in our markets will not reach a higher figure than 5s. 6d. per imp. stone; and mutton of first-rate quality is sold in the shambles at 5d. per lb. Wheat, 63lbs. per bushel, 5s. for white; and 4s. 6d. to 4s. 8d. ditto for red. These are really free-trade prices; and if such is to be our standard of value for produce, land will in a short while come to market value, but ere then many of our farming brethren will be *numbered with their fathers*. The most pleasing feature we can record of our future prospect is the full employment of the working classes. Draining is very generally being executed on many estates; and the gentry seem more alive to spend spare capital on labour than on other less profitable investment. We must now close with one word about the potato, which again is likely to go to wreck, despite all our care and attention. Complaints are very prevalent that this valuable esculent is fast spoiling in the stores. We closely examined a clamp that were very carefully stored about the second week in October: a part is gone; but fully nine-tenths are to this day safe and wholesome.—Dec. 20.

YORK HORSE FAIR offered a show of horses unprecedentedly large. The attendance of spectators was very great, but there was throughout an evident indisposition to do business. During the first two days the more valuable animals were shown, and first-rate carriage horses and hunters fit for work commanded high prices. For second-rate horses of every description there was a perfect stagnation—many never had a bid—and those which changed hands were sold at a price far from satisfactory to the vendors. The prices receded during the fair, in consequence of the supply so greatly exceeding the demand, and those sellers who stood off on Tuesday were glad on Wednesday to strike bargains at a further reduction in price. There were many unsold—especially among the young animals, which were unfit for the purposes of dealers. On the whole we have rarely or never had a fair at which more horses have been shown, or more company present; but as to the amount of business we cannot report favourably, and what was done was far from satisfactory to breeders generally.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF DECEMBER.

The second year of free trade in corn is now drawing to a close; and although thousands of industrious and deserving men have been ruined by the experiment, nothing has hitherto been done to mitigate the evils by which the agriculturists of this kingdom have been made to suffer. That wheat cannot be profitably cultivated in these islands, under existing circumstances, at such prices as have been current since the repeal of the Corn Laws, is a fact admitted by all parties; but farmers were for a long time told that the low value of their produce was the result of panic, and was attributable to themselves. The Free Traders declared, in the House and out of the House, that matters would mend—that an impetus would be imparted to all branches of trade, which would give ample and full employment to the working classes, and enable them to consume more food; in fact, that universal prosperity and happiness must result from their favourite scheme, in which farmers would be sure to participate. But what is the result of two years' experience? Agricultural produce has been depressed to a point ruinous to the growers, without any adequate increase of prosperity to any important class. That the depreciation in the value of wheat will be permanent, and not temporary, can no longer be doubted; and that an average of 40s. to 45s. per qr. will be the utmost which can in future be calculated on, past experience sufficiently proves.

During the year 1849, the first under the new order of things, the average was 44s. 4d. per qr.; and though the last crop was extremely deficient in this country, the present price for the kingdom is below 40s. per qr. This being the case, farmers may regard it as settled that the value of wheat will, as long as the law of import remains as it now stands, be more frequently under than over 5s. per bushel; and it will be well for them to hold this constantly in view in all their future engagements. The prospect is not cheering, but it is best to know the worst, so that every effort may be made, by obtaining a reduction of rents and other burdens which press on the land, to improve their position as much as possible.

In taking a retrospective view of the trade during the last year, there are few points of interest or novelty to draw attention to. The general character of business throughout the twelve months has been dull and unprofitable. Bad as the position of the agriculturist was at this period last year, many—very many have suffered further losses and vexations, notwithstanding the energy and perseverance with which they have struggled against their difficulties. To increase their troubles, they have unfortunately had unpropitious seasons to contend with. The first few months in the year were tolerably favourable, and in the early part of spring the winter-sown wheat presented a promising and healthy aspect. The Lent corn was likewise well got in; and notwithstanding the disheartening effects of free trade, the prospects of good crops gave courage to the cultivators of the soil to devote their best energies to their occupation. The month of May proved cold and ungenial; and though part of June restored confidence, a severe frost about the middle of that month, when much of the wheat was shooting into ear, did mischief which was never afterwards recovered. To this circumstance we are inclined to attribute the prevalence of blight, which detracted so materially from the produce. Further injury was done in the blooming time by high winds; and subsequently, when the ears began to fill and the head had become weighty, very large breadths of wheat were beaten down and lodged so badly by a succession of thunder-storms, as never to regain an upright position. When we add to this catalogue of misfortunes that the weather was wet during a large portion of the time the crops were being cut down and carried, it will easily be perceived that the produce could hardly prove satisfactory, and the test of thrashing has since proved that, both in quantity and quality, the wheat crop of 1850 was inferior to that of ordinary good average seasons. Previous to the introduction of free trade, farmers have generally been in some measure compensated when, unfortunately, the seasons have proved unpropitious for the shortness of the yield, by an increase of price; but, with importations on such a scale as now regularly flow into this country, the productiveness of the home crops ceases to have much influence on the value of the article, and, so far from any rise having taken place, the tendency has since harvest been the other way, as we shall show more clearly when we describe the fluctuations which have taken place at Mark Lane.

In the earlier stages of its growth, the barley crop was generally well spoken of; indeed, until the storms of July caused it to be extensively lodged the promise was good; this was, however, fatal to the quality, and it has now been ascertained beyond doubt that only a small proportion is suitable for making good malt. We are, however, inclined to think that, as regards the yield to the acre, there is less cause of complaint than in respect to wheat. Until within the last few weeks the farmers did not bring barley forward freely, and its value was therefore well supported. Latterly, however, the supplies have increased, and at the markets in those districts where this grain is most extensively grown prices have given way about 2s. per qr. during the month.

The breadth of land sown with oats in England was, we believe, smaller than usual last spring, but in Scotland and Ireland quite as great as in ordinary seasons. The crop was tolerably well harvested in most parts of the kingdom, and the quality is, on the whole, satisfactory. In many of the English counties farmers have scarcely grown more than sufficient for their own consumption, and even in Lincolnshire and Cambridgeshire the surplus for shipment is not large. Scotland is, however, likely to afford us considerable supplies, and we may also calculate on some quantity from Ireland, though not anything like what we used to receive from thence some years back, the partial destruction of the potato and the very indifferent result of the wheat crop in the sister isle rendering it certain that she will require the greater part of the oats grown to feed her own population.

Beans and peas have given a very bad return in all parts of the United Kingdom. Hay is also considerably less abundant than it has been of late years, whilst the prices of cattle have been beaten down by large importations from abroad ; in fact, the value of all kinds of agricultural produce has been depreciated, notwithstanding the acknowledged deficiency in the yield of most articles. This is a state of things greatly to be lamented, the more so as there appears little prospect of any material or permanent improvement. During the winter, whilst the northern ports of Europe are closed by ice, and shipments rendered impossible, prices of grain may perhaps advance a trifle ; but this would benefit farmers very little, the less wealthy class of agriculturists having been compelled to part with the bulk of their crops long ere now, to raise the funds needed to pay current expenses.

In comparing present prices with those current at the close of 1849, we find that the difference is but slight as regards wheat, but that barley and oats are worth rather more than they were in December last year. This, at first sight, appears somewhat singular, as the produce of the first-named article was undoubtedly the least satisfactory of either of the three ; but it may be readily accounted for when we consider that Great Britain is now affected more by the result of the harvest abroad than by the yield of the home crops. Wheat, though not perhaps so abundant as in some former favoured seasons, has yielded well over a large portion of continental Europe ; whilst spring corn suffered from protracted drought. It is consequently calculated that however deficient our wheat crop may be, the surplus growth of Russia, Poland, and Germany will keep down its value in our markets. In America the wheat harvest has also been very productive ; and, in addition to the large quantities of flour already received from thence, considerable importations are likely to reach us. We shall now proceed to give a more detailed account of the changes which have taken place in quotations at Mark-lane since January last up to the present time. Throughout that month the London market was supplied largely with wheat of home growth, and the deliveries from the farmers were likewise liberal in the agricultural districts. The effect of this was a decline of about 4s. per qr. at Mark-lane. The tendency continued downward in February and March ; and good red Essex and Kent wheat were sold as low as 38s. per qr. Before the close of April the backwardness of the spring began to have some effect on the minds of holders, and they became less anxious to sell. In the month of May a rise of 5s. per qr. was established ; but subsequently the weather improved, and about 2s. per qr. of the advance was again lost. Matters remained in this position until about the middle of May, when prices crept up 1s. to 2s. per qr. ; and a further rise of 2s. per qr. was established during July. A few samples of new wheat appeared at market early in August ; but we had no supplies worth naming until the 12th. The quality, though coarse, was not so bad as expected ; the weight of the Essex and Kent runs ranging from 58 to 62 lbs., and picked samples a pound or two heavier ; the prices realized from 43s. to 45s. for good red, and choice white brought 48s. up to 50s. per qr. The following week the quantity brought forward was somewhat large, and both kinds receded 1s. per qr. From that time till October prices remained nearly stationary, and the fall of 2s. per qr. which then took place was afterwards recovered. In November very little change occurred ; but within the last week or two the tendency has been decidedly downwards ; good runs of red Kent wheat being now worth no more than 40s. to 42s., and white 44s. to 46s. per qr. We have only given the quotations of the best runs : low qualities, such as we have received from Lincolnshire and Cambridgeshire, have been sold at rates varying from 28s. to 32s. per qr. ; and the annual average for the United Kingdom will not exceed 40s. per qr.

Since the first opening of the Baltic navigation up to the present time we have had large arrivals weekly from that quarter; which, with shipments on a more moderate scale from Hamburg, Holland, and Belgium, and good supplies of wheat and flour from France, have rendered the millers in a great measure independent of the home deliveries, which have certainly not been so large as to warrant the fall in quotations. The fluctuations in the value of foreign wheat have been so nearly the same as those we have just described as having occurred in that of English, that it would be wearying to our readers to particularize each change. The importations into London have been on a very liberal scale; scarcely a week having passed without large arrivals from one quarter or the other. There has consequently at no period of the year been anything like scarcity; and even during the unfavourable weather at harvest time, when a good deal of speculation took place, the supply was always in excess of the demand, and though prices have at times risen a few shillings per qr., a reaction has generally followed, and quotations are at present nearly the same as they were in the beginning of the year.

Since the bonding system has been done away with, it has become impossible to ascertain the stocks on hand, as, in addition to what goes into the regular warehouses, considerable quantities are worked at once from on board ship, and are taken to different mills, dealers' stores, &c. We are, however, inclined to think that even if no supplies of consequence were to be received for the next three months, the quantity on hand, together with what we are likely to receive from our own growers, would prevent any important advance. At present good Polish Odessa wheat is not worth more than 37s. to 38s., fine 39s. to 40s. Lower Baltic, Hamburgh, Rhine, and French red vary in price according to quality, from 38s. up to 46s. per qr., and Danzig may be quoted from 42s. up to 48s. or even 50s. for choice parcels. During the month rather large arrivals of wheat have taken place from Odessa and other eastern ports off the coast; some of the cargoes have been ordered to Gloucester and Bristol, but the major proportion to Ireland.

The top price of town manufactured flour has undergone but very little change during the last twelve months; in the beginning of the year it was 40s., at which it remained stationary for about three months, when the fall in wheat enabled the millers to make a reduction of 2s., and in April the price was again put down 1s. per sack. From that time until July no variation occurred, though the value of wheat had in the interval crept up several shillings per qr. from the lowest point. On the 8th of July the millers agreed to advance the top quotation to 40s. per sack, at which point it has stood ever since. During the last two or three weeks the sale has been very slow, and it may be questioned whether present rates will be much longer maintained if wheat does not rally. The supplies of foreign manufactured flour, principally French, have throughout the year been liberal, which circumstance has been severely felt by our millers; the stock on the wharves at present is rather heavy, and a large proportion of the same consisting of inferior qualities renders the sale exceedingly difficult. The commoner kinds might readily be bought at 28s. to 30s., whilst good to fine marks are still worth 32s. to 35s. per sack. Nearly the whole of the American supply has gone to Liverpool, the quantity received here having been quite unimportant; prices range from 22s. to 24s. per brl.

Good supplies of home-grown barley were received at Mark Lane throughout the first three months in 1850, and the top price receded until it had fallen to 26s. per qr.; at this point it remained until the new began to come forward. The first arrivals of this year's growth brought 28s. per qr., and it being soon ascertained that only a very small proportion of the new would prove of fine malting quality, selected parcels gradually rose in value, as much as 32s. to 33s. having been paid in November; since then, however, a reaction has occurred, and the present value is about 30s. to 31s. per qr. for fine Chevalier. The fall has been greater on common malting and distilling qualities, the former having been freely offered of late at 24s. to 27s., and the latter at 23s. to 25s. per qr. In the early part of the year we received enormously large supplies of barley from abroad, and many of the importers being compelled to sell from on board ship, prices were forced down to a very low point. In the month of April sales were made of light foreign barley of 47 to 48lbs. weight at 13s. to 14s., and good 52 to 53lbs. qualities were parted with at 17s. per qr. The pressure was much less in May, and since then prices have gradually crept up, the article having been very extensively used for feeding. Present quotations are, for the lighter kinds, 20s. to 21s., and for the best heavy descriptions, 22s. to 23s. per qr.

The new English barley is found to malt but indifferently, and fine old malt has during the last few months crept up in value 2s. to 3s. per qr.; the recent reaction in barley has, however, had some effect, and neither last year's make nor the new has sold so well this month as it did in November. Ship malt may be quoted 45s. to 50s., and fine ware 53s. to 56s. per qr.

Though we have at no period of the year had large arrivals of oats coastwise, and the supplies from Ireland have been on quite a moderate scale, the imports from abroad have been sufficiently abundant to keep down the value of this grain, and in the spring prices were lower than for many preceding years. We find, on looking back, that 37 to 38 lbs. foreign feed oats were sold in the month of April at 12s. to 13s.; very good hard corn, weighing 40 to 42 lbs., at 14s. to 15s., and the best kinds at 16s. per qr. These very low rates had the effect of causing a large consumption, and the market soon became freed, in some measure, from pressure. In May prices rose 1s. to 1s. 6d. per qr., and they have gradually crept up since then, notwithstanding occasional checks. At present Archangel and Riga feed are worth 18s. to 18s. 6d.; Lincolnshire, 17s. to 20s.; Scotch, 20s. to 23s.; and Irish, 18s. to 21s. per qr., which is about the same as at the close of November, but the disposition to speculate has been checked since then by larger arrivals from Scotland than had been calculated on. We have lately had a good many offers of oats free on board at French ports, which has also had a tendency to depress the trade, as it was not thought that that country was in a position to furnish supplies. The contracts entered into, during the month now about to close, to ship from French ports, may be fairly estimated to embrace about 15,000 to 20,000 qrs. The prices paid have been for black feed, of 37 to 39 lbs. weight, 13s. to 13s. 6d. per qr., free on board, to which must be added freight about 2s. 6d. per qr., insurance, &c., which will leave but a very narrow margin for profit.

Beans and peas met with little attention after the seed demand had subsided; and in March and April, when the crops on the ground were considered promising, prices of both these articles began to recede. The downward tendency continued with little interruption up to harvest time, but since then the fluctuations have been rather important, particularly in the last-named article; within the last month, however, there has not been much doing, and quotations are about the same for beans as at the close of November, whilst peas are 1s. to 2s. per qr. lower.

Want of space has obliged us to condense our remarks, but we trust that the foregoing will furnish a tolerably clear idea of the general course of the trade during the year now about to terminate. We deeply regret the losses and vexations which many of our agricultural friends must have been made to suffer by the working of the new system, and sincerely hope that the new year may prove more fortunate.

Before concluding our article it may be as well to give a brief notice of the position of affairs at some of the principal foreign markets, though there is not much change to report since we last directed attention to the subject.

The weather appears to have been of much the same character on the continent of Europe as in this country, and the principal rivers were, according to the most recent advices, still free from ice. Shipments of grain had, however, ceased to be made from the more distant ports, owing to the high rates of freight and insurance.

Danzig letters state that little or nothing had for some time been done for export; and as few were disposed to make purchases for spring delivery, the transactions had been altogether unimportant, in which state of things the tendency of prices had been rather downwards. Fine old high-mixed wheat was, however, still quoted 42s. to 43s. per qr., free on board, in spring. New had been offered relatively cheaper, say fair qualities 35s. to 38s., and fine weighing 61 lbs., 39s. to 40s. per qr., free on board.

At Konigsberg stocks had rather increased, and sellers had consequently become more anxious to enter into contracts to ship in spring, which they had offered to do at the following rates—40s. 3d. high mixed, 38s. mixed, and 36s. 9d. per qr. red. From Stettin we learn that fine Pomeranian wheat, weighing 62 lbs., had been offered at 38s., and 61 lb. Stettin and Uckermark at 37s. per qr., free on board, in spring.

The supplies of wheat from the growers appear to have been tolerably good at most of the Lower Baltic ports, Rostock included; and purchases might now be made for spring delivery at 38s. per qr., free on board, for the finest 61 lbs. to 62 lbs. qualities.

Hitherto comparatively few contracts have been entered into, and there can be little doubt, if our merchants and speculators refrain from sending out orders, that prices will give way further during the winter months.

By the most recent accounts from Hamburg, Rotterdam, and Antwerp, we learn that small parcels of wheat had been bought, from time to time, to be immediately shipped by the steamers; and the navigation of the river remaining free from ice, some further business might, it was expected, be done. At Hamburg 42s. per qr., free on board, had been paid for fine 62 lbs. Wahren, and 38s. 6d. for 61½ lbs. Marks. The price at Rotterdam for fair to fine red Rhine varied from 37s. to 43s. per qr., free on board; and at Antwerp good Louvain, weighing 61 lbs., had been sold at 39s. 6d. per qr., free on board.

From France we learn that wheat and flour continued to be taken for shipment to Great Britain, but that purchasers had acted with sufficient caution to prevent any improvement in prices; indeed, the tendency had been rather the other way, owing to the discouraging reports from hence.

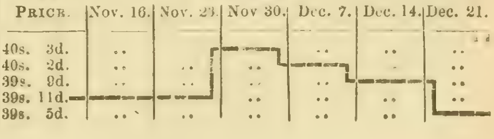
In the more distant markets no variation seems to have occurred in quotations; at some of the Mediterranean ports a good meny cargoes of wheat and Indian-corn had arrived from the Black and Azoff seas, which would, it was thought, be sent on to Great Britain, and we are inclined to think that the receipts from ports lying east of Gibraltar will be rather considerable during the winter.

From America we have advices of recent dates. The weather, up to the time of the last accounts, had continued mild and open, and the inland navigation being unimpeded by ice, good supplies of breadstuffs had come down to the different ports on the coast. No material variation appears, however, to have occurred in prices of flour at any of the leading markets, and quotations are generally too high there, as compared with the value of the article on this side, to offer much encouragement to consign. Shipments had, nevertheless, been made to England on rather a liberal scale, and we may reckon on some further supplies from thence.

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's *Gazette*.	Qrs.	Av. s.	Av. d.	Averages from the corresponding *Gazette* in 1849.	Qrs.	Av. s.	Av. d.
Wheat	98,905	39	5	Wheat	106,161	38	9
Barley	106,277	23	10	Barley	107,073	25	9
Oats	23,527	17	1	Oats	21,424	15	9
Rye	30	23	1	Rye	42	22	9
Beans	5,168	27	8	Beans	6,505	27	5
Peas	1,611	28	2	Peas	3,097	28	11

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING DEC. 21, 1850.



CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.			
WHEAT, Essex and Kent, white, new..	39	to 44	fine up to	49
Ditto ditto old ..	41	45	„	49
Ditto ditto red, new....	37	41	„	43
Ditto ditto old	39	41	„	44
Norfolk, Lincoln, & Yorksh., red, n.	34	39	„	41
Ditto ditto old..	39	41	„	43
Ditto ditto white, new	39	41	„	45
Ditto ditto old..	41	43	„	45
BARLEY, malting, new......................			23	25
Chevalier, new			30	31
Distilling, new			23	25
Grinding, old..........................			21	23
MALT, Essex, Norfolk, and Suffolk, new	43	45	extra	47
Ditto ditto old	44	47	„	49
Kingston, Ware, and town made, new	50	53	„	55
Ditto ditto old	48	54	„	56
OATS, English feed, new............	16	18	fine	20
Potato, old	18	22	extra	23
Scotch feed, new	17	19	fine	20
Ditto, old......................	19	22	extra	23
Irish feed, white, new	16	18	fine	19
Ditto, old......................	20	21	extra	22
Ditto, black, new...............	15	17	fine	18
RYE	24	26	old 23	25
BEANS, Mazagan	25	26	„ 26	28
Ticks.......................	26	27	„ 28	30
Harrow......................	26	28	„ 29	32
Pigeon	28	30	„ 30	33
PEAS, white boilers...............	28	32	„ 28	30
Maple	29	30	„ 29	30
Grey	27	28	„ 27	29
FLOUR, town made, per sack of 280 lbs.	—	—	„ 35	40
Country marks..............	—	—	„ 28	32

FOREIGN GRAIN.

	Shillings per Quarter.						
WHEAT, Dantzic, mixed..	42	to 45	high mixed	46	48	extra	50
Konigsberg	40	44	„	45	47	„	48
Rostock, new	43	45	fine old	44	46	„	48
Pomera., Meckbg., and Uckermk., red				42	43	extra 44	45
Silesian			„	40	42	white 42	45
Danish and Holstein			„	38	40	„ 40	42
Rhine and Belgium..........			„	40	44	old 42	45
French....................			„	38	43	white 40	45
Odessa, St. Petersburg, and Riga..				35	38	fine 38	40
BARLEY, grinding						21	23
Distilling						23	25
Malting						25	27
OATS, Dutch, brew, and Polands						20	22
Feed						16	18
Danish and Swedish feed						16	18
Stralsund						17	19
Russian						17	18
BEANS, Friesland and Holstein	25	26	Konigsberg			28	32
PEAS, feeding	24	24	fine boilers			28	30
INDIAN CORN, white	30	32	yellow			28	30
FLOUR, French, per sack	28	32	fine			33	35
American, sour per barrel	20	22	sweet			22	24

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

	Wheat.		Barley.		Oats.		Rye.		Beans		Peas.	
WEEK ENDING:	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Nov. 16, 1850..	39	11	24	1	17	2	24	2	28	9	29	0
Nov. 23, 1850..	39	11	24	1	17	3	29	6	28	9	29	4
Nov. 30, 1850..	40	3	24	6	17	1	23	6	28	5	29	2
Dec. 7, 1850..	40	2	24	7	17	7	24	3	28	9	29	0
Dec. 14, 1850..	39	9	24	3	17	1	25	11	27	11	29	5
Dec. 21, 1850..	39	5	23	10	17	1	23	1	27	8	28	2
Aggregate average of last six weeks	39	11	24	3	17	3	25	1	28	4	29	0
Comparative avge. same time last year	39	7	27	5	16	5	23	5	28	6	29	10
DUTIES........	1	0	1	0	1	0	1	0	1	0	1	0

ACCOUNT SHEWING THE QUANTITIES OF GRAIN AND FLOUR IMPORTED INTO THE UNITED KINGDOM DURING THE MONTH ENDED 5TH DEC., 1850, THE QUANTITIES ADMITTED FOR HOME CONSUMPTION DURING THE SAME MONTH, AND THE QUANTITIES REMAINING IN WAREHOUSE AT THE CLOSE THEREOF.

Species of Grain.	Quantity imported.		Quantity entered for consumption.		Quantity remaining in warehouse.	
	qrs.	bush.	qrs.	bush.	qrs.	bush.
Wheat, from British Possessions	3908	6	3908	6	9	2
Barley, do.	—		—		—	
Oats, do...............	0	2	0	2	—	
Peas, do..	504	2	504	2	—	
Beans, do...............	—		—		—	
Maize or Indian Corn, do.	—		—		—	
Wheat, foreign	315675	0	316227	3	10693	0
Barley, do.	68254	5	68489	5	15	5
Oats, do.	42889	2	42889	2	24	1
Rye	—		—		6	0
Peas, do.	28751	1	28751	1	527	2
Beans, do.	45641	1	45949	1	5508	5
Maize or Indian Corn, do	46443	2	46443	2	—	
Buckwheat	0	2	0	2	—	
Beer or Bigg	—		—		—	
	cwts. qrs. lbs.		cwts. qrs. lbs.		cwts. qrs. lbs.	
Flour from British Possessions..............	70969 2 17		70969 2 17		10 3 3	
Flour, foreign	416345 3 12		416365 0 5		2939 2 5	

PRICES OF SEEDS.

Linseed (per qr.).. sowing 54s. to 56s.; crushing 40s. to 42s.
Linseed Cakes (per 1,000 of 3 lbs. each) .. £8 0s. to £9 0s.
Cow Grass (nominal)........................—s. to —s.
Trefoil (per cwt.) .... 14s. to 18s.
Rapeseed, (per last) new £25 to £27 ...... old £— to £—
Ditto Cake (per ton).................. £4 10s. to £4 15s.
Mustard (per bushel) white 5s. to 7s.; .. brown, 8s. to 10s.
Coriander (per cwt.)......................... 16s. to 24s.

HOP MARKETS.

BOROUGH, MONDAY, Dec. 23.

The approach of Christmas has restricted operations in our market to the actual wants of consumption. In prices we have no alteration.

POTATO MARKETS.

SOUTHWARK, WATERSIDE, Dec. 23.

We have had very large arrivals the last three days from Yorkshire and Scotland; as this large fleet has so recently arrived, it is impossible to give an opinion on the price they will go at. The following are the present quotations:

York Regents................	90s. to 100s.	per ton.
Scotch	65s. to 80s.	
Scotch Cups	65s. to 70s.	
Wisbech Regents	70s. to 90s.	
French whites..............	70s. to 80s.	

WOOL MARKETS.

LEEDS, Dec. 20.—There has been more doing in sales of combing wools, and prices have an upward tendency. We do not quote any change in clothing wools.

LIVERPOOL, Dec. 21.

SCOTCH.—There is, if anything, a little better demand for laid Highland, and to close sales before the end of the year, rather less money has been taken. White Highland is in rather more request at our quotations. Crossed and Cheviot Wools are still much neglected, except at a reduction on our present rates.

	s.	d.		s.	d.
Laid Highland Wool, per 24 lbs....	9	0	to	9	9
White Highland do.................	11	6		12	6
Laid Crossed do...unwashed	10	6		12	0
Do. do...washed	11	6		13	0
Laid Cheviot do...unwashed	11	6		14	0
Do. do.. washed......	14	6		18	6
White Cheviot do... do.	24	0		28	0

ERRATUM—Page 8, line eight, for "*larger* even than potatoes," read "*longer* even than potatoes."

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THE FARMER'S MAGAZINE.

FEBRUARY, 1851.

No. 2.—Vol. XXIII.] [Second Series.

PLATE I.

A DEVON OX.

The subject of our first plate, a Devon Ox, was bred and fed by James Hole, Esq., of Knowle House, county of Somerset. Mr. Hole obtained for this animal a silver cup, given by E. A. Sanford, Esq., at the Taunton Cattle Show, in November, 1849, as a prize for the best fat ox exhibited by the breeder.

PLATE II.

MOUNSEER; Winner of the Chester Cup, 1850.

PEDIGREE.

Mounseer, bred by Mr. Ford in 1846, was got by St. Francis out of Mademoiselle by Economist, her dam Red Tape by Rowton, out of Pigmy by Election.

St. Francis, bred by Mr. Thornhill in 1835, is by St. Patrick out of Surprise by Scud. He was a very capital race-horse, having won twenty-eight times, including the Ascot Cup and Vase; and when in form, with old Sam Chifney on his back, the plain snaffle in his head, swish-tail, and quiet even style of going, had a most varmint workmanlike appearance, which his performances fully corroborated. As a stallion, though not yet reaching the highest degree, he holds a very fair rank, his list of winners including Impression, Lady Frances, St Ann, St. Antonio, St. Rosalia, and others.

Mademoiselle, bred by Mr. Ford in 1842, is little known in the "Calendar," having indeed been covered at three years old, and throwing Mounseer as her first foal. In one of the October Meetings of this same year, 1846, she was brought to the hammer with the rest of Mr. Ford's stud, and knocked down to Mr. Jaques for 42 guineas. She was stinted at the time to Coronation, and lived to produce to him Dauphin, a very poor performer; shortly after which she injured her spine and was destroyed.

At the same sale Mounseer, then a brown colt without a name, was purchased by the Honourable Major Pitt for 36 guineas, and in whose name and colours he commenced and closed his career.

Mounseer was a brown horse, standing about fifteen hands two inches high; he had a good blood-looking head, strong neck, fine oblique shoulder, with fair depth of girth and barrel, though a little slack towards the back ribs. He had strong powerful quarters, large thighs and gaskins, good arms, and clean hocks—being very short from the knee and hock to the ground. He was altogether a low lengthy animal, carrying his head down and his full bushy tail well away from him, very much indeed in the style of his sire. Like St. Francis, too, he was very quiet tempered as well as very game when thoroughly roused; though this generally took all the hand and heel power of his jockey to accomplish —in stable phrase he wanted plenty of paying for his work. When opened, Mounseer was found to be one of the most muscular horses ever known.

SUMMARY OF MOUNSEER'S PERFORMANCES.

In 1848 he started twice without winning.	
In 1849 he started seven times and won once:—	£
A Handicap Plate at Newmarket Houghton Meeting, value clear	50
In 1850 he started six times and won three:—	
The Cup at Chester	2,320
The Cup at Salisbury	50
The Queen's Plate at Salisbury	105
Total	£2,525

where the worm prevailed, until, in a year or two, the land was entirely freed, and that without any recurrence of the evil. It seems that Mr. Charnock has, on several occasions since then, had recourse to the same means of preserving his carnations (which are plants very liable to be attacked by the wireworm), and he has invariably witnessed the same satisfactory result. The soils of Mr. Charnock and Sir W. Cooke, on which these trials were made, are dry lands on the magnesian limestone. The soils on which those of Lord Albemarle were carried on were the light turnip soils of Norfolk; but, as Mr. Charnock adds, we see no reason for supposing that it would not be equally efficacious in other soils.

The way in which rape-cake operates in the destruction of the wireworm is an object of considerable interest. The analysis of this cake, by Professor Way (*Farmers' Almanack*, vol. v., p. 5), does not indicate any peculiar substance, except the rape-oil, likely to account for its powerful action. In rape-cake and rape-seed he found—

	Rape-cake.	Rape-seed.
Nitrogen	5·23 ..	4·21
Oil	11·63 ..	37·84
Water	7·06 ..	6·44
Ash	5·70 ..	3·31

In 100 parts of the ash of linseed-cake, linseed, and rape-cake, he found—

	Linseed-cake.	Linseed.	Rape-cake.
Silica and sand ..	12·12	1·45	13·07
Phosphoric acid ..	32·12	38·54	32·70
Sulphuric acid ..	3·10	1·56	2·15
Carbonic acid ..	0·90	0·22	1·62
Lime	8·14	8·40	8·62
Magnesia	15·34	13·11	14·75
Peroxide of iron ..	2·51	0·50	4·50
Potash	23·57	34·17	21·90
Soda	0·82	1·69	—
Chloride of potass	—	—	0·17
Common salt ..	1·06	0·36	0·46

The mode, then, in which the rapecake operates upon the wireworm is not clearly understood. That it attracts the vermin, and that it causes their death, is attested by all those who have tried it. This is probably owing to the portion of oil it contains. It may be that the oil of the white mustard, which is a crop strongly recommended to be grown, as destructive of the wireworm, operates in a similar way. It is certain that linseed oil attracts certain insects, and I have noticed that even newly painted wood-work attracts earwigs in large numbers. That it is not the spirits of turpentine which is the attractive portion of the paint seems certain, for, in common with all other insects, this substance is most noxious to them. By the trials of M. Bierkander, a celebrated Swedish naturalist, he found that all those vegetable substances which contain turpentine were very destructive to the wireworm. He contrasted these with other vegetable substances—thus, when placed in tea-cups, and surrounded with the leaves of garlic, they lived nine days, in water four days; whilst in the leaves of the spruce they died in fourteen hours, in fir leaves ten hours; and by direct experiment, turpentine has been found to be exceedingly pernicious to them, since it is well ascertained that when wireworms are immersed in the spirit of turpentine they die instantly, although in alcohol they will live for four or five minutes. These facts suggest to us the trial of the effect of mixing a portion of the spirits of turpentine with the seed corn about to be sown in soils peculiarly liable to the attacks of these vermin. If used in moderate quantities, so as merely to impart a strong odour to the seed, there is a reasonable probability that they would be rendered completely distasteful to the wireworm, and that this odour would attach to the seed for a very considerable period. Care should of course be taken not to add the spirits of turpentine in such large proportions as to run the risk of injuring the seed. We are not, however, aware of any facts which should lead us to conclude that the immersion, even for a short period, of seed corn in the spirits of turpentine, would injure its vegetative powers; in any case, however, the trial is readily made on a small extent of land. Mr. Tallent, of Little Haughton, in Northamptonshire (*Jour. R. A. S.*, vol. v, p. 202), gave the following evidence of the successful use of the white mustard in securing wheat from these insects:—"I have demonstrated perfectly to my own conviction that white mustardseed will protect the grain from the wireworm. I first tried the experiment on half an acre in the centre of a fifty-acre fallow field, which was much subject to the wireworm. The mustardseed being carried, the whole field was fallowed for wheat; the result was, that the half-acre which had been previously cropped with mustardseed was wholly exempt from the wireworm, whilst the remainder of the field was much injured. Not only was the half-acre thus preserved, but in the spring it was decidedly the most advanced part of the crop, and the prosperous appearance which it presented caused me to repeat the experiment by sowing three acres more of mustardseed in the worst part of a field of forty-five acres, also much infested with the wireworm. The remainder of the field was sown with early frame peas, which, with the mustardseed, were cleared in the same week. The land was then ploughed for wheat, and I had the pleasure of noticing these three acres to be quite free from the worm, and much superior in other respects to the other parts of the field, which suffered greatly. Thus encouraged by these results, I sowed, the next year a whole field of forty-two acres, which had never paid me for nineteen years, in consequence of nearly every crop being destroyed by the wireworm; and I am warranted in stating, that not a single wireworm could be found the following year, and the crop of wheat, which was reaped last harvest, was superior to any I had grown for twenty-one years. I am, therefore, fairly," concludes Mr. Tallent, "under a strong persuasion that the wireworm may be successfully repelled and eradicated by carefully destroying all weeds and roots, and drilling white mustardseed, and keeping the ground clean by hoeing."

The results of these valuable experiments indicate two things very clearly, and of very considerable practical importance to the farmer. First, they show that there exists at least one commonly cultivated crop with which the wireworm cannot exist, and that that plant (the white mustard) abounds with a hot, acrid essential oil; and secondly, they show that of the plants which were tried, those which contained sensible proportions of turpentine were amongst the most destructive to the wireworm. It is no mean step, in any research after knowledge, to feel assured of the possible accomplishment of the object for which we are struggling. It is a still further step to be able to see that object actually accomplished, since that suggests other and perhaps more useful, because more practical, paths. In the same spirit, it would be well to cause the plant *Myrica gale*, sweet gale, or Dutch myrtle, to be chemically examined; since, in the trials of Bierkander, to which we have before alluded, the leaves of this plant caused the death of the wireworms with far greater rapidity than any of the other kinds of leaves with which they were treated—placed in tea-cups with these, the wireworms died in two hours. It would be well, then, to ascertain the nature of the substance to which the Dutch myrtle owes its peculiar smell, since that is most probably the portion of the plant which is so peculiarly noxious to the insect. These important and difficult researches are peculiarly those to which the attention of the Council of the Royal Agricultural Society of England should be directed. What they have hitherto accomplished in this way, they have done well (and the path is a right Royal road); and it would be still better if they paid still greater attention to these noble objects. It would be a wise course to extend their rewards to more than one great professor of chemistry, and not to confine the attention of these to an examination of the mere inorganic matter of plants, but to engage some of these in far more minute, and far more difficult experimental researches than the mere chemical analyses of the ash of plants or the food of live stock.

ON CULTIVATED PLANTS, AND THEIR AGENCY IN MAINTAINING THE BALANCE OF NATURE.

BY M. M. M.

It is far from an easy task to classify organized beings. The chain of creation possesses such a regular and unbroken gradation, that it is far from easy to say where the animal ceases and where the vegetable begins, or to state very precisely where organized matter ceases and where inorganic matter commences. There are many animals so like some tribes of vegetation that any general description will hardly apply, while in some substances it can scarcely be decided whether they possess vitality or whether they are merely operated upon by the laws of inanimate matter.

Dr. Carpenter, for instance—no mean authority on physiological science—distinctly declares yeast to be a vegetable. He says—"It appears, from microscopic examination of a mass of yeast, that it consists of a number of minute disseminated vesicles, which appear to constitute one of the simplest possible forms of vegetation."

Without either affirming or denying the accuracy of this hypothesis, I may instance the red snow of the Alpine and Arctic regions, which, though for a long period considered as a mere peculiar conformation of dead matter, is now proved to contain cells and vesicles, and to possess the characteristics of vitality.

It is evident that life alone will not define a vegetable, because that property is enjoyed in common with animals. The fact of possessing motion will no better account for it, for some of the animal jellies possess the same peculiarity. Another favourite characteristic, whereby animals might be distinguished from vegetables, was at one time considered to be the possessing of the gas nitrogen in its structure by the former class, but more recent and careful analysis has determined that many, nay, most vegetables are found to contain it.

More recent investigations, however, have determined that the power of secreting starch is confined to vegetables alone; and therefore, in the present state of knowledge, the definition of a vegetable is, "a cellular body, possessing vitality, living by absorption through its outer surface, and secreting starch."

Our earth is in nearly all its parts covered with vegetation — excepting perhaps the African deserts, and even these have here and there distributed their oases. In the wildest regions we have forests almost interminable. When the trees are absent, there are the equally extensive prairies clothed with jungle. Then, the rich meadows of our own country abound in ample verdure; our exposed and lofty mountains are covered with the heather, and even our rocks and buildings are clothed with the mosses. Nor is even the bottom of the ocean free from living plants. The sub-marine forests at the bottom, and the floating vegetation at the top, are sufficiently indicative of the wideness of the area over which vegetation is spread; and, indeed, on the bottoms of our brooks and rivers the stones are covered with filaments of vegetation.

Some parts of several of these plants are of use to mankind, and hence human skill has been applied to facilitate the development of such plants, and such parts of these, as afford food, or clothing, or medicine for man.

The potato is cultivated for its root, the turnip for its bulb, the sugar-cane for its stem, the hop for its flowers, the wheat for its seeds, the cabbage for its leaves, and we possess the power of exciting development in particular organs in a remarkable degree. The potato in its natural state, in Peru, is found not more than three inches high, with large flowers and tubers the size of a hazel nut; whereas by cultivation the flowers become insignificant, the stem increases, in some instances to the height of five feet, and tubers weighing, in some cases, as much as three to five pounds; such are now produced by the cultivation of a series of years.

The wheat plant originally grew several ears from one stem. In this climate, though it may cease to grow more ears than one, and, on introduction, the ears are only developed as buds, still it shows an extraordinary tendency to throw out stems instead of ears.

I have a specimen of a wheat-plant, which is a single root of wheat, presented to me by Colonel Croft, of Stillington, which has 73 stems growing from it, and which formed the same number of ears.

The transplantation of this grain also shows the amazing power cultivation possesses over the plants of our earth. Mr. Miller, by transplanting the shoots from one grain several times over, obtained three and three-quarters pecks of corn, or very nearly one bushel.

Plants consist of a variety of materials, and may, by analysis, be resolved into some fourteen different substances, which we now call simple. If wheat is ground, for instance, we can separate it into flour and bran; but, though thus divided, it admits of still further divisions.

If I take flour and water—called paste or dough—and wash this in water, it will be observed that, while I shall wash out one substance which sinks to the bottom of the glass, I shall have another in my hand. I have washed out the starch which is suspended in the water.

Nor is this a simple substance. Chemistry determines it, though a solid, to be a compound chiefly consisting of gases; and it consists of carbon, oxygen, and hydrogen. So the substance I had left in my hand, called gluten, is not a simple substance, but four substances—three gases and a solid—carbon, oxygen, hydrogen, and azote.

If I burn a vegetable, you would observe that part of it burns away; the oxygen, the hydrogen, the nitrogen have escaped, and the substance I have left is carbon or charcoal. I have also a specimen of wheat, which still retains most of its shape, but has lost its weight, and is black. This is from Mr. Dresser's Mill, of Topcliffe, after the fire which burnt it down, and it is the carbon of the corn.

Alluding for one moment to these gases, I may observe that oxygen is a colourless gas, in which a flame is sustained with great brilliancy, and it forms a considerable part of the atmosphere we breathe. Hydrogen is a similarly colourless gas, which will burn itself, but will not sustain flame. Nitrogen will neither burn nor sustain flame. But the oxygen will unite with the carbon or charcoal, and make a gas called carbonic acid; of this I shall have to speak in a future part of this paper.

If I proceed with the burning of the plant, the carbon or charcoal will unite with the oxygen of the air, and so pass off, and I have left the inorganic part, or the ash, and this consists of a variety of constituent elements: these are, potash, soda, lime, magnesia, oxide of iron, oxide of manganese, silica, chlorine, sulphuric acid, and phosphoric acid.

Now, it becomes an interesting question, if plants contain these elements, from whence do they obtain them? These inorganic or mineral matters, we have alluded to, they probably acquire from the soil. If I burn a piece of soil, the first process is to blacken it, or convert it into carbon. Then, by applying more heat, the carbon is driven off, and the red of the particles which remain are the inorganic or earthy matters of the soil.

If we reflect for a moment on the way in which the soil is formed, we shall see that it must contain those materials which the plants require. The action of the air and water break down rocks, which crumble to pieces. To these crumbled masses the mosses begin to attach themselves. These die, and are succeeded by other plants, which undergo a similar process; and this mass, so accumulating, becomes soil, containing the earths or inorganic parts we have named, and the gases and carbon the organic; so it is easy to conceive that plants may derive the whole of their nourishment from the soil alone. In reality, however, they do not. Oxygen forms part of the atmosphere, and also forms part of the water. Hydrogen is not found free in nature, but always in combination. It exists in water and in ammonia, which is always present in the atmosphere, and therefore plants may, and in fact do, derive their oxygen from water, and their hydrogen from water and ammonia.

As regards carbon, it exists in the atmosphere, but in a very small proportion, in the shape of carbonic acid; and it must be evident that plants obtain it from other sources than the soil, from the fact that many tons of hay may be taken from a meadow with little carbon being returned. It is calculated that ten hundred weight per acre of carbon is removed from the soil by every crop; and therefore, taking the pressure of the atmosphere at 15 lb. per square inch, there will be 63 grains of carbonic acid per square inch, or seven tons per acre. From this, it is plain that the plants of the earth would be sufficient to consume all the carbonic acid in the atmosphere in 14 years, if it were not supplied. How it is supplied it will be our duty to shew shortly.

The nitrogen of plants is also derived from the soil and from the atmosphere. There is constantly in the latter minute but appreciable quantities of ammonia and of nitric acid. These are brought down by the showers of rain, enter into the plants, and thus a constant source of supply is afforded to vegetables, but a supply which would, like carbonic acid, soon be exhausted if it were not supplied by some material process.

Besides what they imbibe, plants also exude materials, and this kind of respiration is allowed to proceed, similar in some respects to the respiration of the animals. I have stated they take in carbon in the shape of carbonic acid. This, as I stated, is a combination of oxygen and carbon; the plant takes up the carbon, stores it away in its sugar, in its starch, in its gum, and in its gluten; forms, with these, the bark, the wood, the leaves, the flowers, and the fruit; and thus the oxygen not being all needed, we find that they are continually giving off this oxygen, so that plants act as living laboratories by which carbonic acid is manufactured into oxygen.

And what, then, is the balance of creation? When the magic touch of vitality first exerted its vivifying influence on inorganic matter, thousands of protean forms were called into existence. 'Tis only the babbling lunatic who can conceive the monstrous idea of this arising from itself or from chance; but, inasmuch as one animal preys upon another, and several upon plants, inasmuch as these are co-existing together, does it not demand a power equally wise, equally foreseeing, equally provident, to enable each to sustain its position in the scale of being, and to prevent us from being overrun with any particular race, or with any species of that race? Take, for instance, the fact of the existence of 1,500 varieties of reptiles, 1,200 quadrupeds, 1,500 fishes, 6,850 birds, and 300,000 insects, does it not require a power most amazing, an intelligence omniscient, to order, and regulate, and keep the whole in proper bounds. And yet the whole history of our world shows that to these a law far above them all, and above humanity, says, "Hitherto shalt thou go, and no further."

Sowerby, Thirsk, Dec. 14, 1850.

(To be continued.)

ON THE CULTIVATION OF WASTE LANDS.

To reflect on the many thousands of acres of what were formerly considered *waste lands* which are now brought into a state of fertility!—that through every succeeding reign, from the time of Queen Anne to the present, and in each successive reign, from a few hundreds to many thousands of acres of such inclosures! and while with this is borne in mind that 15 millions of acres of land, capable of cultivation, yet remain untilled. Again of the vast amount of waste labour—ten hundred thousands of able-bodied paupers in union houses! Here are sources of labour remunerative and reproductive. Indeed, every acre of land capable of cultivation ought to be properly cultivated in this country before you encourage emigration—before you get rid of the consumers of the article which your every exertion is to produce an increase. Do you increase consumption by sending these people to the antipodes? Do you invite competition of labour by making these people *dead* to the homes of their birth, and *deaf* to your calls? Do you in neglecting to enlarge the sphere of your enterprise make best for yourselves in the commerce of landholding? No! Why then is there so much waste of labour, waste land, waste manure? and why, if this view be incorrect, did government grant two millions of money for the improvement of land? And why do landlords yet ask for more? Again, why do insurance offices offer to increase these loans upon the same terms? Indeed more lands must be cultivated as population and refinement increase so fast, or in future days you will have sterile lands where cultivation is now going on; in truth, extensive cultivation is one of the principal and permanent means of making this country figuratively, "a land flowing with milk and honey." It is a trite yet a truthful axiom—"if all lands are fully worked, all will equally wear."

If it were asked, "What is the best interest of the agriculturist?" The answer should be—"To produce as much as he possibly can within the nearest limits." That is home produce, high farming. What has improved the condition of agriculturists in Scotland? Precisely what is here contended for. Why has Ireland retrograded? Because she has refused, has neglected the axiom, or rather the command—"*To cultivate and increase*"—a principal cause, but perhaps not the only one.

The Chinese call us "red-haired barbarians." Is there no foundation for the cognomen? Although these people wear long pigtails, and live in what we call "gingerbread houses," yet look to their agriculture—learn from them. Their land is an universal garden. The Flemings, poor as they are, may be offered as an example in their mode of cultivation, where not a weed withers in waste, where the valuable qualities of liquid manure are appreciated, which, forsooth, English farmers do but sneer at.

How often is theory railed at! Yet, in the name of common sense, is not *generalization* the application of all practical knowledge by scientific rules, deduced from *comparison*, or the results of experience?—the substitution of rational principles for vague popular prejudices? The whole resolves itself into this: inferences are drawn from particulars; science generalises these particulars for the economy and advantage of the agriculturist. *Axioms* these—*dogmas* those.

To what little use is *irrigation* applied in this country! but what has this not done for Holland? The crops raised by these industrious people within a given space would astonish some of our countrymen.

"Neu segnes jaceant terræ," &c.
GEORG.

Again, in hilly districts why do you not imitate the terrace mode of cultivation so common in Switzerland?

But take one example, "to the purpose quite," and—

"——— Crimine ab uno
Discite omnes."

Go but a few miles south, or south-westward of London, where for miles you may notice land almost devoid of vegetable covering; Bagshot Heath is an example, which has 380 parts of siliceous sand in every 400 parts. Then on the Portsmouth road, by the Devil's Punch Bowl (perhaps the crater of some extinct volcano), viz., from Godalming almost to Petersfield, it is of the same character, where the land produces nothing but heaths and ferns, and where the proprietors have most mistakenly planted forests of fir trees to invite and to lodge large quantities of game. 60,000 acres of such land in the county of Surrey! Even here, nature has provided a remedy close at hand in the vast chalk hills of the neighbourhood. These in their present state will not feed a sheep per acre, because neither lime nor any of the earths singly will support vegetation; it is their due admixture, combined with organic matter, that makes land fertile.

Compare *agriculture* with the *arts*, how infinitely has the latter surpassed the former in the last fifty years! It is true that farmers have just now difficulties to contend with; but let them not imitate the waggoner, who, when his horses stuck in the mud, called for Jupiter to help him. What was the reply? "Put your own shoulders to the wheel." Yes, let them give their earnest endeavours to produce superabundant supplies, and so—

"Reddit agricolis labor actus in orbem."

And lastly, let it be impressed upon their minds, "that the best education, and the highest culture in a rational state of society, does not seem inconsistent with a life of hard work. The work of a farmer is, or ought to be, a school of mental discipline: he must watch the elements, must understand chemically and physically the nature of the soil he tills, the characters and habits of the plants he rears, the character and disposition of each animal that serves him as a living instrument. Each day makes large claims on him for knowledge and sound judgment, and every man's real goodness is according to the amount of service he renders to the world. Mere outside show, or even amount of pelf unjustly obtained, should have no distinction; yet in the pseudo taste of the present day, one would fancy the world was mad, while it bows in reverence to those who, by superior *cunning*, have possessed themselves of the earnings of others.

JOHN ASHFORD.

Hinckley, Leicestershire.

ON TOP-DRESSING LAND WITH MINERAL MANURES; AS CLAY, CHALK, &c.

Top-dressing of land means the laying on the surface of the ground of such substances as are known to increase the quantity of the vegetable produce which grows from the soil. It may be very reasonably supposed that this mode of using fertilizing substances would precede the application of them under the soil or mixed with it, as the effects of substances accidentally dropped on the ground would first attract observation, and would suggest the use of the acting materials in that way, and also the modes that were subsequently adopted. The very oldest writers on agriculture do not mention manures at all; and though their successors notice the substances as being an essential part of cultivation, we are left in utter ignorance of what way the dung was applied to the land. Since the date of the earliest records of modern agriculture, the mode of using manure by spreading it on the surface of the ground has always held a very prominent place; and even at the present day it forms the manner of using fertilizing substances that is imperatively directed by the nature of the substances that are used, and not far from being sanctioned as the most beneficial mode by the results of practice and the investigations of science. Observation, both intuitive and practical, has ever acknowledged that all fertilizing substances which are reduced in particle and minute in coherence, are most economically used by being spread over the surface of the ground, as the distance between the elements is more reduced, and affords more opportunities for combinations and reciprocal affinities. The materials that are more gross in nature and larger in bulk require to be reduced by preparation and mixed in opposite qualities, in order to attain a state of minute adherence. Experience has ever recorded the fact that the effects of substances used as manures on the surface of the ground are in a direct ratio with the minute or aggregated form in which they exist, and that they are efficacious or they fail in effect, according as they are reduced in particles or concreted into masses. All chemical combination is the result of electric attraction, and bodies unite according to the distances at which the power is exerted. It is a general law that the efficacy is in the inverse ratio of the affinity of aggregation; for this latter power holds together the homogeneous particles, and prevents their separating and joining the parts of another body; and the greater the power is, the less efficacious must be the affinity of composition. Bodies combine from being in opposite electrical states, and decomposition consequently proceeds from the same electrical condition. This action cannot take place unless the substances be mixed in the most intimate manner; and it happens only between the ultimate particles of bodies, and at insensible distances: if the attraction of cohesion only happens—in which the bodies retain the qualities they possessed before they were joined, and can be separated by mechanical force—there will be wanting the combination that results from the uniting of the different substances, whether simple or compound, and incapable of being reduced mechanically, and of which the properties are often different, and sometimes opposite to its former constituents. This affinity of composition is one chief agent in the operations of nature and art; and the ease and rapidity with which bodies are decomposed, or enter into new combinations, are directly as the quantity of the surfaces which they present, or inversely as their masses. The efficacy of composition is inversely as the attraction of adhesion—the absolute force remains the same, but increases on account of the diminution of the opposing attraction. Electric attraction is the principle in action, and chemical affinity is the power by which bodies unite; the one being in this sense a measure of the other. All chemical forces are subordinate to the cause of life and to heat and electricity, and to mechanical friction and motion. The latter power is able to change their direction, increase or diminish their tendency, and also completely to stop and reverse their action. Causes must exist to produce chemical affinity, or the cycle of life would stand still; and from our ignorance of these causes, and of the application, it is probable that in many cases their action is arrested and stopped; often rendered useless and not produced at all, or at best but accidentally. Bodies that have little or no affinity, and do not enter into combinations, are made to do so by the addition of one or more substances; and this principle shows the necessity of applying a number of substances at one time, and of bringing them into contact with each other in a state of very minute adherence. Many kinds of chemical action are effected by heat, electricity, and other agencies over which any control is impossible, and which do not take place from mere comminution and mixture; yet by that process a ready accession of means will be afforded of producing combinations, which in another state of existence of the substances would not have happened. Science shows that quantity is necessary in many cases to produce any combination whatever, for an increase of quantity is known to be equivalent to a superior affinity; and though no rule has yet been obtained in respect of the quantities to be used in each particular case, yet the strongest presumptions may be drawn in favour of the above conclusion being generally applicable.

The maxims of chemistry that have now been quoted are quite decisive in showing that all bodies from whose union and combination the benefits of new formations are expected, must be brought into contact in a state of comminution, and must be very intimately mixed, in order that the distance may be insensible between the molecules of the different bodies which produce the reciprocal action. Though one general principle produces the operation, it is very much influenced by various causes: as by the quantity of the bodies or substances, and by temperature in a great degree, by electricity and by mechanical pressure, by insolubility, and by other causes arising from peculiar circumstances. One body, at least, must be in a state produced by solution or fusion: water, or some liquid, is necessary to produce a heterogeneous affinity, and the union results from the reciprocal action of the molecules of the two bodies on each other. Different effects are accordingly produced on different objects in different situations, and the quantity and degree of the exertion of the power depend on various and changing circumstances; for bodies, in changing state, also change capacity. A knowledge of the phenomena of nature, shown in the order and mutual dependence of combinations, would enable us to make them subservient to the improvement of the arts, and direct them to the useful purposes of life. It may be very fairly questioned if agriculture has yet derived one-half of the benefits of comminution and mixing of the soil with the substances that are used as fertilizers. Experience has ever shown that the superior effect of substances on the face of the ground arise from the finer state in which the materials exist, and that much of the benefit derived is owing to the attention that is bestowed on that point.

Nature has produced bodies in various forms and qualities, minute in bulk, diminutive, reduced in size, concreted and aggregate, and hard or soft, fusible or vitreous, harsh or sweet, acid, acrid, or corrosive. Some are more simple than others, or they are formed of fewer elementary substances, and are consequently capable of exercising a chemical action on all substances in contact; for all bodies of simple constituents have an aptitude to enter into combinations and to effect decompositions, and the results will depend on the strength of the respective actions. In making a change in the nature of bodies, fire and water are the two effective agents: the former banishes the existing qualities, and confers new properties; the latter, by its insinuating power, disintegrates the mass and sunders the particles, and brings the elements into a fresh contact in an entirely different form. For the purpose of being used as manures most bodies require to be altered in some way, by means of which the quality is brought nearer to the condition which is known to yield the desired purpose. Hardened or rocky substances are acted upon by fire, and earthy matters are impregnated with liquids. Other similar ways are used to prepare the various mat'ers that are known to form the useful substances.

MARL.

Of the fertilizing substances that are used in the natural state, and for the application of which little or no preparation has been found necessary, marl holds a very prominent place. The word means "marrow, fat, or a preparation of the earth;" and by the ancients it was called "terræ adeps," and was well known to them. It is a calcareous earth, or a carbonate of lime with portions of other earths, and assumes a fat, unctuous appearance, after crumbling or dissolution. Geology places it in the tertiary formation, resting upon the gypsum, and alternating with it; the bed is white and calcareous, and contains silicified remains of trees, plants, and shells; other beds are argillaceous, and of great thickness, and often contain balls of celestine, or sulphate of strontites. The uppermost beds are thin, and contain large quantities of oysters; marine shells abound in the beds that join with sands and sandstones, and the last bed is of the fresh water denomination. Marls have been found stratified in some parts of Europe.

The component parts of marl are so minutely divided as to be invisible to the naked eye; and from this circumstance, and from their containing both salt and fresh water organic remains, and from the fissile structure, it has been conjectured that they have been produced by the detritus of other substances, and that they have subsided from a liquid state. This supposition is strengthened by the circumstance of the substances occurring among the fletz or secondary strata. They are soft and opaque, and miscible with water by agitation, soluble in acids with effervescence, harden in the fire, and vitrify with a strong heat; and to constitute true marls, the substances must contain as much clay as to fall into a powder in water, and crumble into minute pieces by exposure to the air, and generally showing a hoary congelation from the effects of the rays of the sun. The quantity of calcareous matter varies from two-thirds to four-fifths, and may be separated by most of the acids, which will wholly dissolve the substance, and leave a residue of clay, which is composed, as usual, of alumina and silica. Marls are often found indurated, and form "Florence marble," and very like a compact limestone; and also schistone, as at Monte Bolca, in Italy. Earthy and hard marls are supposed to be produced by the decomposition of the latter, but the two kinds do not always accompany each other.

In agriculture the marls are called stony, sandy, clayey, and shell marl, according to the appearances it assumes in different situations where it is found at various depths under the ground. The first is usually called "rotten limestone;" it is slow and very lasting in operation, and very favourable to the production of grasses. "Sandy" marl is most frequent in Ireland, in the pits of limestone gravel, and is called limestone sand; it feels gritty, and moulders slowly; does not effervesce with acids, owing to the large quantity of sand in its composition, and on clayey lands it has very much improved the texture of the soil when liberally applied. "Clayey" marl is found of different colours—yellow, blue, red, and brown—occasioned by the substances to which it has been exposed, and by the subjacent and superincumbent formations; it contains more clay than other marls, generally from 60 to 80 per cent., and 20 to 32 of carbonate of lime, and 8 to 10 of sand, with some signs of iron; consequently it possesses a greater power of absorbing and retaining moisture; the feel is soft and unctuous, flexible like a paste, and dries and crumbles by exposure; the effects are very great in improving all light and thin soils, sands, gravels, and loams, as the clayey basis adds to the staple of the thin soils, and produces consolidation. "Shell" marl is found in places that have been covered with water, and is supposed to have originated from testaceous animals, being composed of shells converted into calcareous earth, more or less refined and pure, according to the attrition and decomposition they have undergone during a long period of time, and according to the quantity and quality of the substances that are mixed with them by the deposition of the earthy and muddy matters left by the sediment of the waters. This kind of marl contains more calcareous matter than the others, generally more than the ordinary limestones.

Most marls effervesce in acids when fresh; after burning the ebullition ceases. But several varieties are used that show no affection by acids, and have been long celebrated as manures. Clay marl effervesces feebly, and hardens in the fire; while the more calcareous sorts dissolve in powder, and all marls are easily vitrified and crumble by exposure, according to the solidity of the texture, and when burnt soon fall by the attraction of moisture, and feel greasy when they contain any particles of mica. Marls are generally found in a moist state, especially the argillaceous sort; they soon crumble by exposure, but lime is not altered. After calcination lime falls into powder by means of air and water, but marl suffers no change.

The effervescence of calcareous substances in acids shows the presence of the substance, not the quantity: the effervescence will vary according to the strength of the acid, and the compactness, penetrability, and other latent qualities of the calcareous bodies themselves. Marl contains no salts, and the composition of it is very peculiar as a carbonate of lime.

A mixed marl has been found to contain per cent.—

Fine sand	36.
Clay of a soapy kind	44.
Mould	5.
Carbonate of lime	14.
Gypsum	1.
	100.

The chalk marl in Norfolk contains in 100 grains—

Chalk	85 grains.
Sand	10
Clay	5
	100

Clay marl of the same county in 100 grains contains—

Clay, with some iron	50 grains.
Impure chalk	43
Sand	7
	100

A kind called "dove marl," from the similarity to pigeons' dung, contains as much as 98 per cent. of carbonate of lime.

Marls have been supposed to be derived from the ruins of the primary and secondary rocks, worn down, carried about, agitated, and deposited without any relation to the laws of specific gravity. Animal remains are found at considerable depths, and even stones of great weight are met with where no rocks of the same or of a similar kind are known to exist in the surrounding locality, or in the adjacent geological formations. Fire wholly changes the nature of bodies that are subjected to the violent nature of its influence, and gives them qualities they did not before possess, and banishes others which they never afterwards recover. Decomposed lavas are exceedingly fruitful, and the heat of volcanoes produces a most luxuriant vegetation in all places within its reach; and it has been very fancifully conjectured that marl may retain some of the qualities which its constituent substances acquired as rocks by the igneous agency of their production. Such conjectures are amusing, but add nothing to the science, or the systematized experience of any art, or to the use of any material.

For the sake of conciseness, marls may be divided into two kinds, shelly and earthy. Minute accuracy will make many subdivisions, but these two names will mark the distinction of having more earths or lime in the constitution of the substance. Shell marl is generally found under mosses and at the bottom of lakes, soft and of a bluish-white colour, and seems to be a natural deposit where water has been stagnant. The composition usually partakes of the nature of the surrounding earths, and may properly be considered as a compost of organic matters with earths and calcareous materials reduced without the action of fire. It often occurs in ponds and land-locked bogs, on the sides of hills and the banks of rivers, formed by the accumulation and decomposition of small shells, as wilks and periwinkles, and also of bivalves; and lying in beds of different thickness, running horizontally, but seldom of great extent: in has been found to contain 84 per cent. of pure lime.

Clayey marls are found below mosses and in low wet places at the foot of hills, and in the vallies between them. The composition of the quality varies much—from 15 to 40 per cent. of calcareous matter, and the remainder of clay and sand, with mixtures of sand, loam, clay, and chalk, according to the nature of the animal, vegetable, and earthy matters which abound in the locality, and which have been collected and decomposed together. Separate and distinct beds of clayey and sandy marls have been found alternating with clays and limestone, of which clay is the undermost stratum, the marl being of different colours, as it has been exposed to the elements composing and surrounding it—the redness showing the presence of iron, whiteness that of calx, the blue and yellow showing the clayey composition mixed with other substances. It is sometimes found very hard to dig, with lumps of chalk and limestone in it, lying under stiff clays and low black grounds, and very compact and greasy; sometimes flaky, smooth, and red in colour, crumbling, and of a very good quality. Other kinds are slaty, and of the shape of flags, and of a bluish colour; are easily dissolved by the action of rains and frosts, and are of good quality.

Marls are well suited to be used as a manure in top-dressing lands, as the substance crumbles by exposure, and the particles are most minutely divided. The most preferable application consists in laying it on grass leys in the end of autumn or in the early winter, when the herbage will be of little value, and when the changes of the weather will effect the decomposition of the marl by the time the grass shoots in the spring. It will thus secure an even spreading over the surface; and the bush-harrow and the roll being afterwards employed, the particles will be well reduced and pressed into the sôil. The crop of grass will be greatly improved, and when the land is ploughed for a grain crop in the following season, the marl will be thoroughly matted in the turf, and the vegetable sward which it has raised will most materially promote by its decomposition the subsequent fertility of the land. This mode affords time for the crumbling of the marl, and it raises a close vegetable growth on which the future crops depend for nutriment. The substance that is used for top-dressing cannot be incorporated with the soil from want of arable culture, and consequently the effects depend on the influence which it is able to exert on the materials with which it comes into contact. By raising a large quantity of grassy herbage in the shape of roots, leaves, and culms, it affords, by the decomposition of these substances when the land is ploughed, a vegetable " pabulum" to the growing crop, to which no manure yet known is superior, if any one be equal to it, either in power or durability. Consequently all top-dressings of an earthy nature should be used wth the view of producing this vegetable growth for the support of future crops. The quantity of marls used in this way on grass lands may be stated at an average of 40 to 60 cart-loads of two horses.

The use of marls on the fallows of barley and turnips in the spring admits of the better mixing with the soil, provided the suitable reduction of the marl be accomplished, which may be done by exposure, if the weather be favourable, before the last ploughing of the land, and when the nature of the marl itself favours the dissolution. It is often necessary to go over the work and break the lumps of the marl with hand mallets. The weather is the best operator, and the time of exposure may produce some useful reciprocal actions. In whatever manner marls are applied, it is most absolutely necessary that the substances be reduced as fine as possible by breaking the lumps, spreading it evenly by harrowing and rolling when dried after rains, and by being ploughed into the ground by means of a shallow furrow. Some marls will crumble to powder immediately on exposure, or very soon after; others require the changes both of summer and winter, and also much attention in improving on the action of the weather, by breaking, harrowing, and rolling.

The effects of marls have been much the greatest on dry heathy grounds that have been converted into arable cultivation, and on sandy loams; and on all sandy lands generally the applications have been very beneficial. On raw damp loams reports are less favourable; the marl attracts moisture, and thus increases the poachy looseness of the land. Clays are much improved by large quantities of marl; but the clay must be well pulverized in order to facilitate the incorporation with the marly substance. Practice directs the use of clayey marls on all light lands, and the application of sandy and shell marls to heavier lands; but all these substances have been found useful on any soils when judiciously employed.

Marls are often made into composts with earths and farm-yard dung, either in layers in the heaps or in the bottoms of the fold-yards, where it will be soaked by the urinary juices, and afterwards mixed with the mass. It is thought that such a preparation is more effectual than marl by itself. Frequency of marling may produce a hurtful looseness in the land, which is very easily removed by the pasturing of the land in rest for some few years. The avaricious use of the plough has produced the trivial hurtful effects that have been observed from the use of marls.

The action of marls is usually attributed to the quantity of calcareous matter which they contain, and to the change it creates in the land by a mechanical action, and a mucilaginous matter that is derived from the exuviæ of animals. The extremely minute blending of the ingredients of marl has been supposed to constitute the fertilizing quality—each particle having the power of exerting its peculiar property on the soil and on each other, and of retaining or giving out the substances they may form that are favourable to vegetation, by the different agencies and combinations. The clays impart moisture to the sandy parts, and the sand prevents the clay from being too adhesive; and thus the respective qualities are exerted advantageously on each other. An oleaginous nature has been discovered in its composition, arising from the mixture of the substances with animal and vegetable matters; and to this property much of the fertility which it produces has been ascribed. It is also thought to be an absorbent earth, composed of clay and limestone; and that the useful quality is derived from the very intimate mixture of these valuable ingredients.

The quantity of calcareous matter is no certain criterion either of the quality or effect of any substance. A mineral acid will show the presence of calcareous matter, but affords no directions either of the general quality of the substance as a fertilizer, or of the quantity that will be required to produce a result. The quantity of calcareous matter is no certain criterion either of the quality or of the effect; for the marls that effervesce little or none by the application of an acid are good manures; and marls of great difference in colour and in chemical composition have been dug from the same pit, where they lay contiguous and almost mixed with each other, and have shown no discernible difference of effect on any crop when applied in equal quantities on the same soils. On coarse heathy pastures an application of marl produces the usual effect of calcareous matters, in banishing the rough foggage and substituting a close sward of finer grasses. This result will be obtained by the use of any substance, provided it be properly prepared for the intended purpose.

Marls exposed for years retain the same properties as when newly dug, do not effervesce after calcination, and good marls feel greasy when touched, and friable when dry, and the land is generally good above them. The red and blue colours, with yellow veins, are found to be the best in quality. Marls are known by breaking into small pieces from exposure, by the crackling of the particles of dry marl in the fire like salt, and by throwing up bubbles to the surface of the water by which it is covered, and by gradually dissolving, and forming with the water a soapy substance like a paste, and not unfrequently of a liquid nature, the marl remaining dissolved and suspended in the water without any coagulation. But water alone will produce bubbles when poured on certain dry clays; and hence it is recommended to subject clays to water for a time before being tested by an acid. Marl contains no alkaline salt, as it imparts no quality, smell, or taste when digested or boiled, and has nothing that is soluble in water. Muriatic acid may be applied till the effervescence ceases. The loss of weight will show the quantity of air expelled, and the remainder is earths. The quantity of calcareous earth may be ascertained by dissolving the marl in muriatic acid, diluting the liquid with water, passing it through a filtering paper, and then precipitating the calcareous earths from the clear liquid by a solution from some fixed alkaline salt.

Marl is a heavy body, and, being used in the crude state, it is not, like lime, lightened by incineration, and rendered more conveniently portable. It is, in consequence, usable only in the vicinity of the localities where it is found, and where two journeys can be performed in a day. Reckoning on this convenience, the cost per acre cannot be stated below £4; and in most cases it will be above that figure. But, on the other hand, the advantages from the application are amply sufficient to repay that amount of expense, in very greatly improving the texture of light sandy lands, by consolidating the materials, and by attracting moisture; and on grass lands by bringing forward grass plants of a better quality, and in raising a thickly-matted quantity of grassy herbage to afford food for the following crops by the future decomposition. On all grass lands that are intended to be ploughed for crops, the top-dressings should be applied at least one year previous to the land being broken up, in order that the vegetable food may be provided by the effects of the dung upon the surface. This point is very generally neglected.

It has been very plausibly conjectured that marls are a natural compost formed of calcareous and other soils, and that the fertilizing property consists in the very minute blending of the particles, which almost escape detection by the microscope. This supposition very strongly confirms our earnest recommendation that all earthy composts be very finely pulverized, in order that the comminuted intermixture of the ingredients may yield the reciprocal action of the ultimate elements of matter. An idea gathered from nature not only strengthens and brightens experience, but advances the theory and ennobles the art.

CHALK.

"Chalk" is a calcareous earth, and the most stratified recent formation of carbonate of lime. It is divided into hard and soft chalk, and rests on the third sandstone formation; effervesces strongly with acids, and is distinguished from magnesia by not being disturbed by the caustic volatile alkali. Specific gravity, 2·252 : 2·316 : 2·657 : 2·226, and contains:

Lime	56·5, or		53·0
Carbonic acid	43·0, or		42·0
Water	0·5, or		3·0
		Alumina	2·0
	100·0		100·0

Hard chalk is burned like lime, for building purposes; and soft chalks are used in top-dressing arable and grass lands, as clover leys, stubbles intended for wheat, and on bare summer fallows. It should be dug from the pits in autumn, and laid at once on the land to be dressed. The rains and frosts will be useful in pulverizing it; and what is left unreduced must be broken by means of axes and hammers. Some attention is required in getting chalk properly pulverized. The fat, unctuous kinds soon crumble on exposure; but the harder sorts require longer time and much labour. The quantity laid on an acre varies very much, according to local circumstances. A medium may be stated at 40 to 50 cart-loads, and from 8 to 15 loads of a waggon. The expense of carrying a crude heavy article very much restricts the use of the substance, and chalk in the original state falls under the list of these materials.

The use of chalk as a top-dressing is best obtained in the form of a compost with earths and peat, as is the case with all calcareous substances. It is a mild agent, and possesses no destructive solvent quality, which attaches to the limestones after undergoing the action of fire. In an unmixed state, chalk absorbs moisture, and attracts acids which hasten putrefaction; and the mechanical action lies in uniting with clays, and forming a resemblance of marl, and preventing the stubborn hardness of the land in summer, and the wet adhesiveness in winter. On grass lands, it has the usual property of a manure of any kind, in banishing the coarser herbage, and bringing in the place of it the white clovers and grasses of a sweeter quality. Chalk has a very strong affinity for water, and consequently is most useful on dry lands and gravels by attracting and retaining moisture for the use of the growing plants. And this use is very much assisted by being mixed with earths, and brought into contact with animal and vegetable remains in a state of minute subdivision, which settle downwards into a stratum round the roots of the plants, and forms the source whence the nutriment is drawn, and which was formed by the application. Hence arises the superiority of earthy substances, for the purposes of top-dressing, over the effects of caustic stimulants. The latter exert a passing influence on the growing bodies of the moment, but leave no residuum as a source of future use.

At a minimum calculation, the expense of a dressing of unmixed chalk cannot be less than £4 per acre, or 40 cart-loads of 2s. each. This amount supposes a favourable contiguity of the chalk and of the land on which it is to be used. When made into composts, the expense will be very similar, as the smaller number of cart-loads per acre will meet the cost of collecting the earths and turning over the heaps. In very many situations the cost will be considerably above £4, owing to the expense of carriage, and the quantity of the article that is required to produce any effect. If this quantity be not large, the expense will be wholly lost; for quantity is most imperatively required, in many cases, to rise to a superior affinity. The most important recommendation must not be omitted—that all aggregated bodies that are used in top-dressing must be reduced to a finely-pulverized state. Lumps of chalk will lie on the surface of lands without being broken; the plough and the harrow turn them over, and the roll presses them into the soil; but the purpose will be entirely defeated, unless the body be finely reduced. Well-prepared composts have an advantage in this way.

On soils of the lighter description—sands, loams, gravels, and even on chalky lands, very great improvements have been done by large applications of chalk, the effects of which have not ceased with a few crops, but have operated like all calcareous substances in imparting properties to the land that it did not before possess, and at the same time increasing the quantity of every crop. The quantity applied must be large; and when used for top-dressing grass lands, it must be applied one year or more before the land is ploughed, in order to raise a close, grassy sward, which by its decomposition affords the food of the future crops. This vegetable stratum, in its formation, constitutes the value of earthy top-dressings. Chalk is a heavy body, and is not much used, and less in the native locality than at distances to which it is carried.

CLAY.

Clay is a mixed body, mostly composed "alumina, sulphuric acid, and water." It is found in vast beds in the alluvial deposit of the tertiary formation, of which chalk, or the most recent condition of lime, forms the basis, and is much mixed with other bodies in different states and combinations. The prevailing colour is brown or reddish brown, yellow, and sometimes bluish. Sandy, gravelly, often solid, more or less unctuous, and soft to the touch; often friable and dry, breaking into small lumps, containing more silex, and loses its plasticity; and perhaps no body is found in a greater diversity of composition, in soils and in slates, and in all argillaceous formations. It enters into all good lands—in fertile soils, from 9 to 15 per cent.; and in barren lands, from 20 to 40 per cent. The absence of it forms a soil too dry and porous; and a superabundance of it constitutes a soil too wet and cold when in a moist state, and contracts and hardens by heat into a condition that is adverse to vegetable life. Clay is found calcareous, meagre, and unctuous, effervescing with acids, rough and gritty, and containing a greater quantity of alumina. The purest specimen contains upwards of 60 per cent. of sand, and is always mixed with mineral, animal, and vegetable substances. The aluminous base inbibes 15 times its own weight of water, and retains it with great obstinacy.

Like other substances, the quality of the clay, the mode of its combination with other substances, and the exposure of the combined elements, render it a fertilizer, both in the simple state and in the condition of a "compost" with other substances. When found of a clammy or indurated texture, great difficulty is experienced in reducing the substance to particles that can act with and upon the other elements with which the contact will occur. But with calcareous clays the process is easy. The mass is friable and crumbling, and the dissolution is so fine as to allow an intimate incorporation with the soil. Accordingly, very great improvements have been effected by excavating clays of this nature, and laying large quantities of it on the surface of light lands. A moist quality has been given to the sandy soil, and more firmness and a greater consistency. The quantity must be liberal—from 100 to 160 cart-loads to an acre—and must be attentively used in the breaking and spreading of the pieces. On the other hand, ferruginous clays, and those of a white sandy and gravelly nature, are positively pernicious, and require a mixture with substances of a better quality, to correct the noxious property, and also an exposure to atmospheric action, to extract and dissipate the hurtful effluvia. A total alteration must be acted upon the constituents before clays of that nature can be made fertile, either as a cultivated soil or as an application to other lands.

Sulphuric acid in any form or combination is noxious to vegetable life, and in preparing clay for the purpose of acting as a manure that hurtful ingredient must be banished, and more friendly qualities introduced. The quantity of acid and water amounts to two-third parts of the constituents of pure clay, and being in combination, the destruction of both elements must be effected. Some body must be applied that will act violently and forcibly in disintegrating the mass of clay, in sundering the particles, in banishing the existing properties, and in conferring more valuable qualities, by means of reciprocal action and mutual combinations. For this purpose no better agent has yet been found than caustic lime in a state of hot shells newly burned. Lime is the oxide of "calcium," one of the newly discovered terrigenous metals, which contains in 100 parts about 38 of oxygen. An oxide is a sour pungent body, which draws off every volatile substance without fusing the primitive body; it is the circumstance or state of change, while calcination is the mode of effecting it. By the application of a violent heat, lime loses the water of crystallization, and the carbonic acid gas is expelled, which in combination with the earthy base formed the neutral salt known by the name of the carbonate of lime. In the newly-burnt state it forms a strong caustic, and has a very powerful corrosive quality, and the alkaline character of turning vegetable blues into green. After being exposed to the air for a determinate time, it imbibes carbonic-acid gas from the atmosphere, and becomes mild like pounded limestone.

Lime is a homogeneous body, and will exercise a chemical action on all substances in contact, for all bodies of simple constituents have an aptitude to enter into combinations, and to effect decompositions, and the results will depend on the strength of the respective actions. The clammy and indurated clays which are the most abundant must be laid in an oblong heap of about six feet deep in the centre, and sloping at the ends, which will permit the carts to pass and lay the loads of lime upon the surface. The lime must be in the hottest possible state, and the clay may be in any form, dug from the beds of deep deposit, or from the surface ground of soil in mixture, and consequently with a portion of animal and vegetable matters. The heap of clay must be turned over and mixed regularly with the shells of lime in the proportion of two to three, and the sides of the heap sloping all round in order to allow room for the swelling of the mass. When moisture touches lime in a newly-calcined state, a hissing noise takes place, a swelling follows, vapour arises, much heat is evolved, and light is emitted in dark situations. In most cases the water that is contained in the clay will dissolve the lime, if sufficient care be used in mixing the heap that the lime does not lie in dry masses, but is touched by the clay in every shell of its form. The heat that is evolved penetrates the harsh mass of the clay, and the acid and the water are expelled by its action, and are dissipated along with the water of the lime, which escapes in the form of vapour. The aluminous base of clay being thus freed of the acid and the water, which rendered it harsh and rigid, immediately assumes a mild gelatinous form, and being united with the lime, which is now mild by the absorption of carbonic-acid gas, the combination becomes a saponaceous mass of an unctuous nature, which is loosely connected, and easy of decomposition. The harsh properties of both the constituent bodies have been expelled by mutual action, and milder qualities have succeeded.

After the dissolution of the lime shells has been completely effected, and no more heaving of the mass takes place from the swelling of the lime in bulk, a time may be allowed to remain in quietness for the purpose of settling the combination after the union has been effected by the violent intestinal motions that have been provoked by the action of the bodies singly and on each other. After remaining in a quiescent state for an indefinite time, the heap must be again turned over, and the materials very intimately mixed by breaking the lumps, and placing in the centre of the mass the materials that have been exposed on the outside, and consequently will be less decomposed. This movement of the heap will provoke new affinities, produce fresh combinations, and effect additional results. It must be done with much care in reducing the elements to fine particles in order to bring the bodies into contact in the nearest possible ultimate form, and at insensible distances. Unless these conditions be effected, no useful combinations will happen.

It will depend on the state of reduction which the mass of materials exhibits, if it be necessary to turn over the heap the third time; if it be finely pulverized, the necessity will not exist, after it is seen to assume the form of a saponaceous unctuousness, for the beginning of this condition shows that the affinities are exhausted, and that the results of their action are settling into the newly produced state of existence. But if the materials still appear to be crude and harsh, and if the lime still exists in the dry granulated form as it falls from the dissolved cinder, the heap may be again turned over with advantage. The lime is still hot, and will emit caloric, which will enter into and dilute the bodies, separate and dilute the particles, diminish the attraction for each other, and proportionally augment the attraction of the particles of adjacent bodies, and consequently produces combinations and facilitates reciprocal unions. This principle shows the necessity and advantage of the frequent stirring of mixed bodies.

Mixtures of lime with earthy bodies will require two or three turnings, according to the original state of the materials, if they be coarse and lumpy, or fine and easy of pulverization. After every motion has ceased, by reason of the non-generation of heat, the materials will become a saponeceous unctuous mass, and will afford a mucilaginous manure, which is very easily decomposable, and applicable to any purpose of fertilization. The period of time of one year at least will be required to produce a mass of mild and easily soluble materials from the agency of caustics on the crude and harsh earthy forms that contain both volatile and fixed principles of very inveterate hostility. When the mixing of the different bodies is made in summer, the compost will be ready for application in the autumn of the next year, after the hay crop is got, or on pastures somewhat later in the season, when the cattle are housed. An equally good season occurs in the early spring before the grasses begin to rise; but the period of autumn may be preferable in the compost keeping the roots of the plants warm during winter, and affording an earthy bed for the spreading of the creeping shoots of the fibres. In laying the compost over grass lands of old or young duration, carts with broad wheels must be used, with a tire of at least five inches in width. The compost must be spread from the carts by two persons provided with shovels, one on each side to the right and left, over a space of ground in three yards of width to each person. When the earthy mass is laid on the ground in heaps, and afterwards spread, the bottoms are difficult to be cleaned out, and a tuft of herbage grows from the extra quantity of the manure that is left on the spot. By spreading the compost from the carts a superior evenness is obtained, and the work is finished at once.

After the compost has been laid on the surface of the ground, in order to expose the cloddy particles to the action of the atmosphere, the bush-harrow will be very usefully applied in breaking into pieces the lumps which will be formed, and in tending to distribute the mass equally over the ground. For this purpose the harrowing must be done across and lengthwise, so as to act in both directions. When the surface has become thoroughly dry, a heavy roll must be applied, which will level all inequalities, and press together the earthy compost and the roots of the plants. The roll must be very liberally used, both in the autumn and in the spring; one, or even two applications may not be sufficient to produce a close bed for the roots of the plants in contact with the manure, and also level against the penetration of drought.

The quantity of such a compost manure to be used on an acre may be stated at the average of 40 one-horse cart loads, and the cost at 2s. per load, or £4 per acre. Very much of the effect of all manures is lost from want of quantity; the chemical combination of bodies is often produced by the addition of one or more substances, which alter the mutual relationship, and in changing state they also change capacity. Different effects are also produced in different situations, and the quantity and degree of the exertion of the power depend on various and changing circumstances. Besides the quantity and the quality of the substances, much influence is exerted by temperature, by electricity, and by mechanical pressure, by insolubility, and by other causes arising from peculiar circumstances.

The compost manure, which we have now described, being a cool mass, will be best used in cool weather, when the solubility will not be too much hastened by the violent heats, nor be retarded by the pinching colds. A gradual decomposition will best answer the purpose of the assimilation of the elements to the condition of food of plants.

The value is very great of earthy composts prepared in this way, for being used as top-dressings on grass lands of all kinds, and also on fallow lands. Not only the common herbage is increased in quantity, but the quality is very much altered by the invariable result of grass plants of a better kind being brought forward and established on the ground. It is a very beneficial practice to sow the seeds of the better grasses on the top of a liberal application of a good rich earthy compost, and to have them pressed into the fresh earthy stratum by the heavy roll. Inferior grass lands may be very much improved in this way, and at a very moderate cost in the purchase of the lime and the price of the grass seeds. In every case of application the compost of lime and earth is much superior in effect to lime by itself, especially on lands of an inferior description. This truth has been settled beyond all dispute.

The burning of clay for the purpose of being converted into a manure has been often tried with much boasting confidence. By the application of a smothering fire the earths are divided, and reduced into minute particles, and invested with an unknown property which substances acquire that have undergone the action of fire. In this state it is supposed to attract and retain ammonia that is conveyed to the soil by rain-water, and thus affords to plants the nitrogen contained in the ammonia or volatile alkali. Clay is the oxide of "aluminum" (one of the newly-discovered terriginous metals), and is composed of silica, alumina, oxide of iron, and some little inflammable matter, and probably some other substances, but in a very minute ratio. The combination of alumina with the oxide of iron produces the well-known earthy smell of clays. An oxide is a sour body, and oxidation is the state of change that is produced by calcination, which draws off every volatile substance without fusing the primitive body. An oxide is heavier than the primitive body, by reason of the quantity of oxygen which has been absorbed. The action of fire on clay will further oxidize the residual calxes that compose it, and must contain none of the elements of vegetation—a property which belongs to all bodies that exist in that state. Very much, if not the whole value will consist in the composition of the clay itself; and when it is taken from the surface of the ground it will contain both animal and vegetable matters, and the ashes will be of the usual nature after burning. The practice of burning clay by itself has wholly sunk in repute, as it never had a legitimate existence on scientific grounds. A metallic base that has been divested of every other ingredient can form no fertilising substance, and the preparation adds very considerably to the lessening of its value. On the other hand, alumina has a very strong affinity for lime; and hence the very beneficial results that attend the reciprocal action, and which arise from the union of the combinations.

On the subject of using clay it may be added, that the clods of clay-land fallows may be very advantageously pulverized by being laid in heaps and mixed with the shells of hot lime, and which are dissolved by exposure, or by the application of water. The damp heat exhaled by the lime will produce a smothering effect on the clay, penetrate the tough mass, and impart a fertilizing property to the mixed substances. The lime and the clay will be pulverized together, and most minutely blended and mixed in a manner that is otherwise impossible. This mode of using clay has been seldom noticed and little practised; but of the value of the application no doubt can be entertained.

Clay has been laid upon longitudinal heaps of hot dissolving lime, and it is benefited by the penetration of the damp vapours from the bursting of the limeshells; it is afterwards removed and used as a manure. Little certainty is known of this way of using clay. The quantity of lime must be very considerable in order to pierce and crumble a tough mass by means of the damp exhalations. The duration may be doubted of the fertilizing quality that is communicated to the clay by the volatile elements of the caustic lime.

In mixing clays with lime in order to form the compost as now recommended, the special attention must be directed to the laying the clay and lime together in the hottest possible state after the lime has been burned. The dissolution of the shells by the effect of moisture emits much heat, which penetrates and crumbles the tough harshness of the aluminous mass, and reduces it to the condition of being combined in a milder and a more useful form. If the lime be allowed to lie exposed and becomes mild, it loses the character of a caustic solvent, and assumes the state of an earthy ingredient. In this form it does not act on other bodies, and enters *only* into a mechanical mixture with substances that are pulverized in a similar state. The clay is usually in the form of clods and lumps, and requires a powerful solvent in order to disintegrate the mass and sunder the particles. If this reduction be not effected, the lime merely adheres to the outside of the clods: no combinations are effected, and no results are produced by the union of the different bodies. It is an object of the very last importance that the ultimate elements of bodies be brought into contact at insensible distances. The surface of one body being presented to the aggregated mass of another substance affords no opportunity for reciprocal action, the distance is much too great, and the efficacy of combination is in the inverse ratio of the affinity of aggregation; and the greater the latter power is, the less efficacious will be the power of composition. Hence pulverized lime being brought into contact with lumps of clay, can exert no useful influence, and merely gilds the clods with a whiter varnish than they before possessed. This principle is equally applicable to the use of lime on rough clay fallows; the lime is in fine particles and the land in large lumps, and consequently no reciprocal action can happen: the lime is powerless from want of opportunity, and the soil is formed into masses which admit no influence of exterior action. Hence it would answer a very beneficial purpose to form heaps of the clods of fallows mixed with limeshells, which, by bursting and evolving much heat, would penetrate, crumble, and pulverize the clayey lumps, and reduce them to ashes, and mix with the granulated particles of the lime in the most extreme comminution. Peat might also be reduced to ashes by means of the shells of hot lime; and during the process some useful combinations may happen between the lime, the clay, and the moss. Bodies that undergo in conjunction the powerful influence of fire, will have a better opportunity of forming new states of existence than when brought into contact after the action has ceased, and the mutual change of condition has taken place; the susceptibility is cooled by exposure, and the homogeneous qualities are quickly lost, which enable bodies to attract each other and to enter into combinations. Fire is a most violent agent, and the results of its action must be applied immediately on being produced, and before the nature is altered and neutralized by the introduction of adventitious elements. In the case of using lime and clay in conjunction, the quick use of the lime in the hot caustic state is the primary consideration in forming the useful compost by mixing the two substances.

"Farm-yard dung" is sometimes used for top-dressing grass lands; and experience has now decided that it is best applied in the unprepared state, consisting of straw and excrements, as it is produced in the dung yards. It is most beneficially used in the latter end of autumn or in the early winter; and by the time the grass shoots in the spring, the fæces will be partly decomposed, and will have subsided into an earthy stratum that holds the roots of the plants: the strawy part will have afforded shelter and warmth to the vegetable layer, and when the vivifying heats of spring commence, the effects will be protruded with much vigour. In the early spring, any roughness that remains on the surface must be raked off, and the application of a heavy roll will level the inequalities and press to the roots of the plants the earthy decompositions of the fæces from the effects of the action of the winter's vicissitudes. The quantity must be such as will cover the surface evenly and closely when spread by the fork; and care is to be used in breaking the lumps and laying the materials very evenly over the ground; and when the strawy covering is removed in the spring, the combinations that have been forming during the winter will be ready for development in the promotion of vegetable growth. New seeds intended for hay are most wonderfully benefited in this way. As the excremental part of the manure contains an earthy residuum, the seeds of the better grass plants will be very beneficially sown in the spring, and rolled into the ground.

The other substances that are used for the purpose of top-dressing lands may be divided into the two kinds of "earthy" and "pulverulent;" the former existing in the condition of a bulk of more or less size, and the latter in the state of the residuum of combustion.

"Human fæces" and the dung of the smaller animals are very strong in nature, and emit very disagreeable effluvia. They are best mixed with fine earths, which absorb the liquid part of the excrements, and reduce the noxious smell. In that condition a very useful compost is found for being used in the common way. The dung of pigeons is particularly strong. "Coal ashes" are very beneficially used on all sour pastures. They are best reduced by being broken by spade and mattock before the application. The quantity is from 60 to 100 bushels to an acre.

"Salt," "saltpetre," and the "nitrate of soda," are fossil substances, and after being comminuted they exist in the form of granular or cubical masses. They are best sown by hand, from baskets, on grass lands, and on grain crops in a young state. Being deliquescent, rains wash away the substance; and the effects of the application as a manure are not great.

It must be held as a rule that all bodies of an earthy nature must be comminuted as much as possible, in order to be beneficially used as top-dressings.

Among pulverulent bodies "gypsum" has been partially introduced as a fertilizer. The substance is the sulphate of lime, or the earthy base in combination with sulphuric acid. After burning it falls into powder, and has been applied to young crops in quantities of six and eight bushels on an acre, but with very uncertain success. The opinions and the results are very contradictory; and do not obtain a place for gypsum among certain and trusted fertilizers.

"Soot," and "vegetable ashes," are pulverulent bodies, and are sown by hand on young crops of the culmiferous and leguminous kinds. The quantity used on an acre averages 40 to 60 bushels. The effects are very quick and very large, but last only for one year. Such bodies require no preparation but to be kept dry, in order to prevent the "clotting" by moisture, and thus prevent the equal distribution. Moist weather is necessary to the action of the elements, which can be studied in choosing the season of the application. The latter end of April and the first part of the month of May is the most common time of using these light substances. Dews and light moistures fasten the light bodies on the leaves of the plants: heavy rains are injurious, in washing them entirely away. For top-dressing vetches they are most peculiarly applicable, and very highly useful.

All pulverulent bodies are best used on crops of one year's growth, as grains and vetches: the effect is quick and transient, and is confined to one crop. Earthy bodies, that are decomposable and leave a residuum, are best applied for permanent purposes on grass lands, where the use extends to a length of time.

ON TRENCHING LAND.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

Sir,—After draining, all soils should doubtless be deepened; but, from the various practices we see around us, it appears that few are agreed as to the best and cheapest method of doing so. Some use the subsoil plough, some the spade, some the fork. Now, as it is highly desirable that all who have tried any experiments as to the comparative results of the different plans should, through your columns, communicate them to their brother farmers, in order that errors may be avoided, and the best method adopted, I venture to hope that some of your correspondents will give their opinions on this important subject in your Magazine for March. As far as my own observations go, I am inclined to think that in a hard, clayey, stony subsoil, trenching with the spade or fork must be a better plan than subsoil ploughing. It is more expensive, I grant, but it is also more effectual. But the cost is a serious consideration, and writers and farmers differ as to this as much as to the method. To show this I shall give two extracts. Mr. Garnett, in his "Lancashire Farming," inserts a communication from Mr. Hinde, as follows:—"In the winter of 1847, and spring of 1848, I trenched and drained six acres of old ley, and trenched 4 acres 1 rood 35 poles of oat-stubble for green crops, the account of which I give below. The plan I proceed upon is, to set my trenching in beds of seven yards wide, the fall of the land, a drain being cut on each side of the bed. I provide, in the first instance, stones for the first two or three drains, and then commence trenching to the depth of the soil only, breaking up the subsoil 10 or 12 inches with a pick, and throw all the stones on the top of the trenched land. This year I have used strong forks, about 7 lbs. weight, with a projection at the back in this form T, in order to give more leverage. I prefer them to the pick—being, I think, more effectual, and easier for the men. Whilst the trenching is going on, I have other men cutting the drains in the entrenched land, and the stones on the trenched land are wheeled in barrows to the drains, the land abounding so in them that they have seldom to wheel them more than 14 or 20 yards, so that I hardly ever have a horse and cart in the field. I believe this plan to be the cheapest and most effectual for my land, and I have given up the subsoil plough. The trenching is done by the customary measure of seven yards square to the rod, or fall, as we call it; the price 8d. or 9d., at which price a good man can earn 2s. to 2s. 3d. per day; the drains are cut by the rod of seven yards long, three feet deep for stone soughs at 7d., and 30 inches deep for pipe tiles at 5½d.; the soughs are made, tiles laid, and stones filled, and drains filled up by day work.

"Expense of draining, at 30 and 36 inches deep, and seven yards apart, trenching, &c, *six statute acres* of old ley on Ellel Moor :—

	£	s.	d.
Grubbing whins	2	5	0
,, alder bushes	1	12	9
Trenching 595 *falls of seven yards square, at 8d*........................	19	13	8
Cutting 685 roods of drains, at 6d., tiles, stone breaking 258 cubic yards, laying tiles, filling up drains, &c.	45	18	11
Labour, getting up large stones and alder bushes, not let by contract ..	10	0	0
	£79	10	4"

With your permission, I shall now give an extract from the first edition of the "Book of the Farm," in which Mr. Stephens, at page 1334, says:—"A method of trenching land has been recently introduced into Scotland, which deserves attention, both on account of its efficiency and cheapness. It consists of marking off a piece of rough ground equal in breadth to a future ridge. A trench of about three feet is then marked off with a line across the ridge-breadth, and notched with the spade. The first spit of earth which removes the surface of the trench is carried off to the side of the field where the trenching will terminate. The first spit, when removed with a trenching spade, will be from 10 to 12 inches deep. The trench being thus cleared of its upper surface, its subsoil is stirred with *graips,* or forks, as they are called in England, having long and strong prongs, 14 or 15 inches in length. The graips are used in the same manner as the spade; but instead of the earth being lifted up whole, as with the spade, it is cut in pieces with the prongs, except in strong clay, and every stone in it is brought to the surface. The earth not being lifted up and turned over, the labour required to stir the subsoil 15 inches deep is not greater than ordinary delving of the ground. In stirring the subsoil with the graip, the two men employed work side by side, and assist each other in breaking the ground when it rises in lumps, or in bringing the larger stones to the surface. After the trench has been gone over in this manner, the stones are laid along the side of the ground which is being trenched, and also of the last trenched ridge. Another trench is then lined off and notched, and the soil removed by the spade, and placed with its surface undermost upon the subsoil which has just been stirred and freed of stones by the forks. The advantages of this mode of trenching is apparent, in its keeping, in the first place, the subsoil undermost, while, in the next place, the ground is entirely stirred to the depth of at least 24 inches, and wholly freed of stones; and this, in the last place, is a great advantage in new trenched ground, which is not easily passed over with loaded carts. The stones being laid in a row at every breadth of a ridge, are ready for the use of drains, and this trouble is included in the cost of trenching, and is a deduction from its cost; and in most strong soils as many stones will be obtained in this manner as will suffice to thorough-drain the land; but if not, sufficient will be found to form a protective covering to tiles and soles. Men undertake to trench ground in this manner for £2 8s. the imperial acre, and this being the case, it is a much cheaper, and a far more efficient, mode of bringing in *rough* ground, than by any application of the plough."

I lately walked over a gentleman's farm in Herefordshire, where I saw two men trenching land 16 inches for 7d. per square perch, or £5 per acre. The operation was performed as mentioned in the above extracts, the surface soil kept on the surface, and the subsoil *dug* with a draining spade. It appeared to me to be an operation which upon that hard clayey subsoil must pay, notwithstanding the expense. This land had been thorough-drained on the Deanston plan. Now, the trenching being (after draining) a permanent improvement, let us see what interest the owner is likely to get for his money. I have made the following calculation, which I think must be within the mark :—

	£	s.	d.
First year, 4 tons of swedes extra	2	0	0
Second year, 4 bushels of barley extra..	0	14	0
Third year, 4 cwt. of clover extra......	0	12	0
Fourth year, 4 bushels of wheat extra ..	1	0	0
	£4	6	0

being something like 21½ per cent. on the outlay. There is, however, too much difference in the expense to satisfy me; for instance—

	£	s.	d.	
Mr. Hinde gives............	3	5	7	per acre.
Mr. Stephens	2	8	0	
Mr. ———.............	5	0	0	

I should observe, however, that the last price was given me by the men themselves, and not by their employer. Hoping that your readers who have been trenching will give their experience, I remain, sir, yours, &c.,

J. P.

December, 1850.

THE TURNIP-FLY AND THE MEANS OF ARRESTING ITS RAVAGES.

Amongst the very useful societies which are at work throughout the country, we hardly think there is one which for the same small amount of income effects so much good as the Chemicco-Agricultural Society of Ulster. Hailing, as we always do, anything calculated to benefit the sister island in her agriculture, and consequently in her arts and morals and civilization—for as sure as agriculture becomes a scientific pursuit, so sure will these follow in its train—we rejoice to find this invaluable society still at its work of improvement; and the articles in its paper, the discussions at its meetings, and, above all, the presiding genius of Professor Hodges, its chemist, show that, with means ridiculously small, it has accomplished and is accomplishing wonders.

At the risk of appearing to prefer "pork in the dog-days," we cannot help, even at this season, alluding to a discussion which took place before the Society on the turnip-fly, and the means of arresting its ravages, because the good sense of the remarks made, the intimate acquaintance with the natural history, habits, &c., of that insect, were most creditable to the speakers, and would do credit, in fact, to the *conversaziones* of the Entomological Society—if, indeed, its discussions were ever of so practical a character.

We need hardly say that the insect spoken of was the flea-beetle — the *haltica nemorum*, a minute skipping beetle, with ten straw-coloured stripes upon each of his wing cases, which attacks the turnips just before the plumule is developed into leaf, and cuts and consumes the whole of the cotyledon leaves, so that the plant dies: and all this is generally the work of a day. A farmer will look anxiously for his young plants—he will see them spring up with vigour and regularity — he will watch them two or three days—there is a broad, clean expansion of leaf, and the plumule is just bursting into "rough leaf," as it is termed, when, lo! thousands of these minute insects will make their appearance as if they had dropped from the clouds, and the whole crop will disappear in forty-eight hours. And if the crop be white turnips, he may sow once every day, they will never recover. If they are swedes, however, having much more tenacity of life, they will survive, if only the plumule is left uneaten. Once let the secondary leaves be developed, and all is safe: they may be there, and eat to their hearts' content—they may do injury, but they will never destroy the crop.

The remarks made on the natural history of the insect did credit, we said, to the speakers, and especially the paper of the Professor. He says, as to this point, that if they examine the turnip-leaves in the months of July and August, they will find the eggs deposited, which are of nearly the colour of the leaf itself. In ten days the larvæ or maggots, of a white colour, are hatched, and immediately betake themselves to the substance of the leaf, between the upper and lower skin, and then consume the cellular substances of the leaf, forming a series of net-work in it, burrowing in a mass of shapeless mazes, and wonderfully avoiding each other's course in the leaf. For sixteen days they thus proceed, doing little apparent injury indeed; and at the conclusion of this term of probation they drop out and bury themselves about two inches in the ground, there to change into the almost motionless pupa, in which they remain about fourteen days more, and at last emerge in the perfect form. During winter it betakes itself to the crannies of bark of trees, stubble, &c., to be ready to emerge as soon as the turnip or any of its congeners make their appearance, especially the charlock or wild mustard, which is the "early spring food" for a host of these vermin; and it will often be observed that a dozen to a score of these insects are attacking a single plant in the month of April, and before any turnips could be available for its use.

The review of the remedies proposed for this pest is very sound and practical. Snuff, assafœtida, &c., applied to the seed are very properly discarded. Nitrate of soda applied to the seed is spoken of with more favour. Linseed oil and sulphur applied in the same manner are spoken of, we think, also with deserved disfavour. Mechanical modes next come under review; and the ingenious one of Mr. Paul, who sows a plot of decoy turnips some time before he sows his crop, and then catches the intruders in a net, is amongst the most ingenious, and not unworthy of notice. The painted board as a trap, against which the insects jump, and are detained by the paint, is also noticed; but we fear it is but an ineffectual remedy.

The most efficient cure, however, depends on two facts—first, to keep the land as clean of charlock, &c., as possible, and then to push on the plants in their early stage with such a degree of rapidity as to overcome the attack. Hence, we hardly ever knew a soil in fine tilth, manured well with guano or dissolved bones, the turnips reasonably thick, that were totally destroyed. We must say that we have seen striking instances of a powdering of lime preventing the destruction of the plants. We one season witnessed this at Leyfields, near Newark, in Nottinghamshire. Mr. Parkinson had a field most vigorously attacked. He dusted the plants by hand with lime, 2 to 4 bushels per acre. One piece was left for experiment-sake, or from falling short of lime, unsprinkled. The crop was saved, with the exception of the few undusted rows, which were lost.

We cannot help, however, expressing our strong approval of the *prevention* noticed in the discussion before alluded to, viz., till well, keep clean, and use some stimulating manure: this, with plenty of seed, will scarcely ever fail of preventing the destruction of the crop.—Gardeners' and Farmers' Journal.

CAPABILITIES OF A COUNTY CONSTABULARY.

The power conferred upon the county constabulary at the Quarter Sessions last week, of stopping smugglers and seizing smuggled goods, has recalled to our attention the scheme propounded in the appendix to Capt. Mc Hardy's late report, for establishing "an efficient constabulary and defensive force throughout England and Wales, co-operating with the coastguard;—affording increased protection to the public revenue;—improving the present system of recruiting for the army;—obviating necessity of enrolling the militia;—supplying crews for the advanced ships;—an efficient sea fencible;—and checking the rapid increase of vagrancy." The following is the plan:—

"The benefit to be derived by the establishment of county constabularies, under Acts 2 and 3 Vict. cap. 93, and 3 and 4 Vict. cap. 88, having been proved by the adoption of the said Acts in half the counties of England and Wales, and the strong prejudices which existed against such a force having now worn off, its *apparent* expense being the only barrier to its universal adoption, it is evident that great advantages would be obtained, as well as efficiency secured, were Parliament to render the force general, under a uniform system throughout England and Wales; by which, in co-operating with the coast guard, it would not only be a valuable defensive force for the country, but would also more effectually protect the revenue, avoid the expense of the recruiting establishment for the army, and curtail that attendant on raising the militia. I am therefore emboldened to submit the following SCHEME, lest it should be deemed worthy of attention:—

"That an act be passed authorising the government to establish a uniform constabulary throughout England and Wales, with a clause limiting the number, as in the present Act, to one constable to a population of 1,000 (except under an order of council), which would afford for England, independently of the Metropolitan district, 13,000, and for Wales 1,000—making a total of 14,000; the annual expense of which would be about £950,000, including the mounting of 1,000. And by the government paying half this expense, and the remainder being defrayed by local police rates, the scheme would be popular, and the government enabled to make use of it in various departments; by which the government would be considerably reimbursed.

"If the Act under which such a force should be established armed it with the power given to the coast guard for the prevention of smuggling, the difficulties of smuggling would be so much increased, that it would be seldom if ever attempted; by which the revenue would, undoubtedly, be improved, and a numerical reduction of the coast guard warranted.[*]

"As government now pays all the expense of bringing criminal offenders to justice, as also that attendant on prosecutions, a saving would be effected by appointing barristers as public prosecutors, or district counsel and solicitors to conduct prosecutions, with a strict investigation of sums paid to witnesses and others, under orders of court; and a proper system of communication in a well-disciplined constabulary distributed throughout the kingdom would insure facility in detecting offenders, and great reduction of expenditure in bringing them to justice.[†]

"Were the police to recruit for the army, the present expense of £22,000 per annum for the general staff of the recruiting service, and £6,000 per annum to the 45 subdivisions, exclusive of the pay of the officers and privates so employed, would be saved, and they would be enabled to remain with their regiments, and all the evils attendant on their recruiting would be avoided.

"A well-trained constabulary of one constable to a population of 1,000 would afford an efficient and respectable defensive force of 14,000 men (exclusive of the Metropolitan Police) which in cases of emergency could be augmented, and armed, as may appear most desirable; and by the government directing at its pleasure (through the proper authorities) the police to enrol and train at the respective petty sessional divisional stations, such numbers for the militia as it may deem expedient, not exceeding a limited number to the population; as by enrolling five men out of every 1,000 a force of 70,000 would be raised, making with the standing constabulary of 14,000 a total of 84,000, which would be more than double the number authorised by the present Militia Act (40,963) From the constabulary being of necessity generally dispersed, such facility would be afforded for enrolling and training the men for the militia that the expense would be considerably less than any other system, and the men so enrolled would, from being brought in contact with the constabulary, render it more efficient, and afford a source from which to complete or augment the constabulary or standing army, and provide special constables on their being required; and as the militia staff would necessarily be kept up to a certain extent, the respective adjutants could supervise the general training; and it is evident that an efficient constabulary, together with the facility it would afford for embodying a militia, would render the postponement of enrolling privates less hazardous.

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[*] "Since this was drawn up (in 1846,) the coast mounted guard has been disbanded and the revenue cruizers reduced, which renders this more desirable; and I would recommend the sailing cruizers being succeeded, as opportunities offer, by small (wood) steamers, particularly as one of the latter would be as efficient as three of the former, and thus no additional expense would be incurred.

[†] "When this was drawn up in 1846, the government paid only half. See parliamentary return of expense.

"By the seamen serving in the coast guard being made available for ships of war, the government would have at its disposal at least 3,000 seamen for cases of emergency, out of 6,000 or 7,000 officers and seamen now employed in that service. With this reserve, and by placing in time of peace, in her Majesty's ships in commission, only half the present complement of marines, and bearing seamen in lieu, who could be withdrawn in cases of need, and the war or present complement of marines replaced, such an arrangement would place at the disposal of the government, crews for 8 advanced ships of the line, which would with ease be at sea in ten days; and by the coast guard enrolling the sea-faring men on the coast in like manner as I propose, the constabulary to enrol the militia, a formidable sea fencible force might be provided for defending the coast when required, either in block ships, steam vessels, or otherwise.

"That members of the county constabulary be appointed relieving officers for vagrants, which by checking indiscriminate relief, and other reasons, would put a stop to professional mendicancy, and that the discipline of the Poor Law Unions be not disturbed, accommodation for "casuals" be provided under the charge of the constabulary;—the expense of all "casuals" to be defrayed out of the consolidated fund;—and that all low lodging houses be under a legislative enactment, licensed and subject to regulations formed by the justices in special sessions.

"J. B. B. Mc Hardy,
Captain, R.N., and Chief Constable
of Essex."

HARVESTING MACHINES.

In our November number, we gave a letter from Mr. Dennison, an English correspondent, making some inquiries in relation to machines used in this country for cutting grain. In answer to those inquiries, we have received several communications, furnishing much useful information. In connection with these, we give also cuts of Mr. McCormick's and Mr. Hussey's machines.—Eds.

LETTER FROM THE INVENTOR OF MCCORMICK'S REAPER.

Editors Cultivator.—I most cheerfully comply with your request, in furnishing the following "particulars respecting Reaping Machines," in answer to your London correspondent, so far as I can give the information he desires.

I have manufactured at *this place* the three last years, for use on the prairies of the *west*, 500, 1,500, and 1,600 of "McCormick's Patent Virginia Reapers," and am now engaged in providing a like supply of them for the next harvest. I sell my reaper for 115 dollars cash, or 120 dollars part cash and part on time. Four horses (or mules) are required to operate the machine throughout the day, without a change, though the draft is not more than two horse power; and it is attended by a boy to drive the team, and a man to rake the grain from it into gavels of suitable size for sheaves. Six or seven men (or "women," as the case may be) are required to bind and shock the wheat. This is the estimated labour of harvesting wheat that stands up, and yields, say twenty to thirty bushels per acre. If the wheat be heavier, and fallen, the operation will of course be more difficult, and the speed retarded.

This reaper has uniformly been warranted to cut one and a half to two acres of wheat or other small grain per hour (equal to fifteen or twenty acres per day); to save at least three-fourths of the wheat that would be scattered by ordinary *cradling*; and it is also warranted to be durable. Perhaps the best evidence of the *satisfaction* given by the reaper has been the continued large and increasing demand for it. It is constructed to cut as high or as low as required, and the *saving* of wheat by it, over that cut by the *cradle*, is estimated at not less than one bushel per acre, and in some situations more; the whole operation being more perfect than can possibly be done by hand-labour in any way, and without being materially obstructed by "Mayweed, thistles, dock, &c." "What will be the expense per acre of wheat," may be calculated from the foregoing. The following is the estimated cost here, as taken from a certificate signed by some hundreds of farmers who have used this reaper, viz:—

	d. c.	d. c.
Cost of cradling and binding 16 acres of wheat; 8 cradlers and 8 binders, at 1 d. 25 c. each		20 00
Cost of cutting and binding 16 acres of wheat with the reaper, two men, or a man and a boy with the machine, at 1 d. 25 c. and 1 d.	2 25	
Five binders (the grain being raked into gavels), at 1 d. 25 c.	6 25	
Use of four horses (this number of horses, in fact, only nominal) ..	1 50	
Total cost		10 00
Which deducted, shows a saving in labour of half the whole expense, being per day saved		10 00
Amounting, at 10 d. per day, in cutting a harvest of 240 acres, to	150 00	
To which add one bushel of wheat per acre, saved extra (which is the lowest estimate made), at 40 cents per bushel	96 00	

	d.	c.
Making a total saving, in a harvest of 240 acres, of	246	00
The cost of the labour, per acre, by this estimate, is..............		62½
From which deduct for a bushel of wheat saved		40
And the actual cost is found to be, per acre....................		22½

I may add that this reaper has recently been patented in England, with a view to its immediate introduction there—one of them having been prepared for exhibition at the great world's fair, in May next, and for which the gold medal of the "American Institute" has been awarded.

C. H. McCormick.

Chicago, Ill., Nov. 12*th*, 1850.

LETTER IN REFERENCE TO DIFFERENT REAPERS.

Editors Cultivator.—Four years ago, the first harvesting machine was brought into this county, and so fast did such machines come into favour with the farmers, that for the two seasons past nearly all the grain has been cut by them. Mr. McCormick, when introducing his Virginia reaper, warranted it to cut one and a-half acres per hour, and save one bushel per acre more than by the ordinary mode of harvesting, or it might be returned. No machine has ever been returned to my knowledge, or any dissatisfaction expressed on account of a failure to fulfil the warrant.

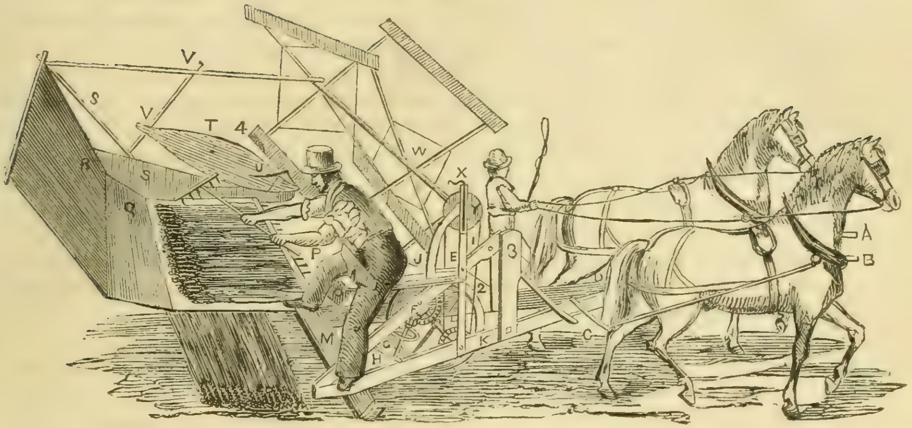
This machine, as well as others, has been greatly improved, while a host of new ones are brought into the harvest-field every year. In reply to the inquiries of your London correspondent, I would say these machines are worked by horses, sometimes two being used, but more generally four. Some of the machines require the horses to go by the side of the standing grain, while the machine works on one side. The cutting apparatus of others is directly in front of the horses. Some drop the grain directly behind, which must be bound before the machine comes round again, while others drop it at one side, and the whole field may be cut before any of it is removed. Some require a man to rake the grain from them; others are constructed for self-raking, and one has been brought into the field the past season that does its own binding.

The cost of these machines is from 75 to 125 dollars; the amount which they will cut per day varies from 12 to more than 20 acres. The price charged per acre for cutting is from 50 to 62½ cents. From seven to nine men are employed to bind and shock the grain. Women's labour is too scarce and valuable to be employed in tying grain. These machines cut all the grain, and if the raker is careful none is scattered, and if the binders carry a rake, and use it, none need be lost. Fields harvested by these machines present a beautiful appearance. The stubble is uniform in height, while no prostrate, scattering straws speak of waste. If the binders have felt at all interested in doing their work well, there is nothing to glean with the sickle, bagging-hook, or rake. Weeds, brush, pitchforks, rakes, if standing in the way, and even horses' legs, are all cut smooth alike. Weeds make heavy raking, that is all.

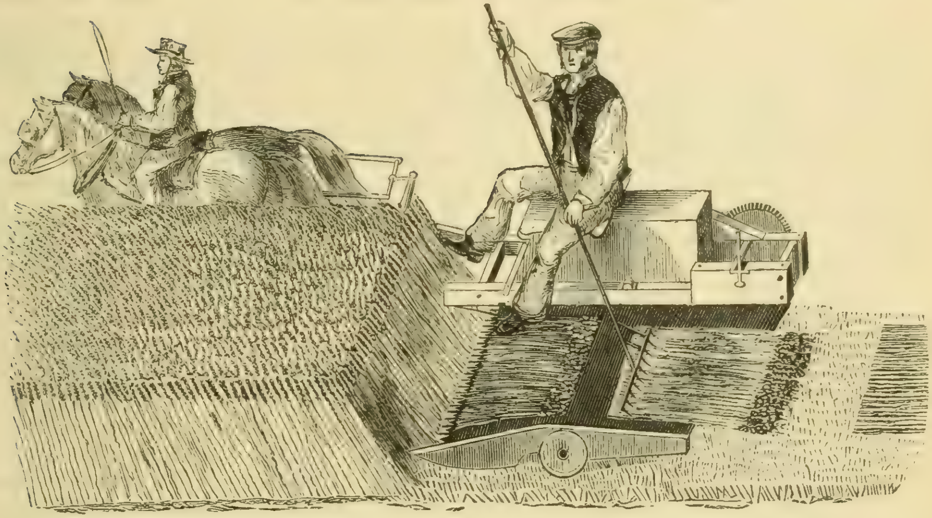
Now, as one man can cut from two to five acres per day with a cradle of the grain that stands upright, and another can rake and bind it, it may be supposed that there is no great difference in the expense per acre by hiring a machine or cutting by hand; but other considerations render the machine valuable in the estimation of farmers. First, it is supposed that it saves over and above other modes enough to pay for cutting, if not the whole expense for harvesting, and then it cuts lodged and crinkled grain readily, saving much in both labour and grain; and again, it enables us to *cut our grain in* season, which we could not do with the limited amount of help in the country.

There are other machines at work in the harvest-field, differing from those to which your correspendent's inquiries alluded. They take the *heads* of the grain only, dispensing with binding and shocking. This machine is really a labour-saving machine; yet, on account of the prejudice in favour of the time-honoured custom of binding grain, they are working themselves but slowly into use. Those who have tried them cannot be induced to return to the old method. The grain as it is gathered in and cut by these machines is thrown into a canvass which carries it one side and deposits it in a waggon-box, made for the purpose, and driven by the side of the machine. From sixteen to twenty acres can be cut and put in rick in a day, by six men and eight horses. The only objection raised against this mode of harvesting is the danger of the grains damaging in the rick, but the testimony of all who have tried it is in its favour. In a damper climate than this it might not save well; but here, with our sunny sky and pure air, I think there is no danger. If we had your correspondent's two hundred acres of wheat here on the prairies, we would, in two weeks' time, with six men and eight horses, put it all in rick for him, wasting no more than he will with all his men and his women.

We are doing more here than your correspondent or many of your readers may be aware of. Horses will soon do our hay-making as well as harvesting. For three years or more, there has been in use a harvesting machine that has been made to cut timothy, and timothy and clover mixed; but not until this year has there been anything presented to



M‘CORMICK’S REAPER.



HUSSEY'S REAPER.

the public that would cut our prairie grasses, some of which are the most difficult of all to cut by machinery. At the late fair of the Buel Institute held at Granville, Putnam county, two machines of different patterns were exhibited, and tested in cutting prairie grass, to the entire satisfaction of all. One of the machines clogged in some of the worst places, but the other cut its way through everything as close or closer to the ground than a scythe, leaving the grass in a much better condition to dry. I learn that one of these last mentioned machines was used some few miles east of us, working to the entire satisfaction of its owner and all others who witnessed its operation. Both of these machines are also designed for harvesters, and both are manufactured at Ottawa, in this county. The price of the latter I understand is 75 dollars.

L. L. BULLOCK.

La Salle County, Illinois, November, 1850.

LETTER IN REFERENCE TO HUSSEY'S REAPER.

EDITORS CULTIVATOR.—In answer to inquiry about reaping machines, page 379 of the Cultivator for 1850, I would state that I have used one of Hussey's for two years. Our wheat crop was not heavy in straw in 1849, and we cut with two horses, changing twice a-day, on an average, rather over fourteen acres. This season the straw was very heavy, and I could not get over from ten to eleven acres cut per day, even using three horses at a time, and changing horses twice or oftener per day.

The machine ought never to be worked with two horses, except the grain is quite light. It requires about seven men to bind after the reaper, one man to drive the team, and another to push off the sheaves from the platform of the reaper. In this way, I think wheat can be taken up as clean as in any way I am acquainted with; even the best reapers cannot do it so clean; it leaves a stubble of about seven and a-half inches in length; it can be cut lower, but then it is harder on the team. Much "May-weed" might impede the cutting somewhat, but docks and thistles would not hinder. Any grain requires to be fully ripe before it is cut with the reapers, as it is impossible for a man to push off the cut grain from the platform when cut in a raw state. It is, on the whole, a wonderful labour-saving machine, as even in heavy grain, nine men may cut bind and shock ten acres per day. The reaper does not work well when the grain is wet, but no farmer ought to cut his grain in that state. When grain is all laid one way, the machine will cut it beautifully by the team working in a direction opposite to that the grain lies; but if it is twisted in different directions, the machine will not work.

Hussey's reaper costs 100 dollars at Auburn.

J. Johnston.

Near Geneva, Nov. 25, 1850.

—Albany Cultivator, Jan. 1851.

THE AGRICULTURAL DISTRICTS OF ENGLAND.

FROM THE TIMES' COMMISSIONERS.

Norwich, April, 1850.

The county of Norfolk has perhaps a higher reputation than any other district of England for its progress in agriculture, yet it has nothing indigenous which commands a first-rate price in the market. The restless Norfolk sheep are almost superseded in their own district by the Southdown. The fine cattle which are sent in such quantities to Smithfield from this county are chiefly bred in distant parts of the kingdom, and brought here to be fattened. The "Norfolks," or "Homebreds" as they are called, are held in little estimation for their quality as stock. The native pig will stand no comparison with the Berkshire or the improved Essex. Fifty years ago the county was celebrated for its trotting hackneys, but that race is now almost extinct. The dairy system which existed has entirely disappeared, and even in the excellence of its wheat Norfolk is excelled by other counties. Yet, notwithstanding the want of any descriptions of native stock, the high qualities of which are recognized, and although the wheat grown is not generally that which brings the highest price, still the celebrity of Norfolk as an agricultural district is deservedly great; that celebrity consists in having introduced and developed a great variety of improvements in the cultivation of the soil, and especially in having contributed so largely to the adoption of that system of green-crop husbandry, the advantages of which are every day becoming more and more apparent. To understand the peculiar features of Norfolk agriculture, it is necessary, and will, we believe, be found instructive, to point out those circumstances of geographical position, soil, and climate, which influence it, and also to indicate how far individual enterprise and other causes have operated thereon.

The county is peculiarly situated in many respects. On the north and east it is washed by the sea, which, besides other advantages, thus brings it into proximity to Holland and Belgium, the most carefully cultivated countries of the continent. Norfolk appears to have profited by the intercourse thus arising, as the improved system of husbandry to which the name of the county is now generally attached is said to be derived from the Netherlands. The southern boundary of the county is traversed by the Brandon and Waveney, which may be seen near Lophamford, flowing to the right and left of the road, with a slow current, the one westward, and the other eastward to the sea at Yarmouth. The course of these rivers is almost entirely through low peaty marshes, which thus separate the dry land of the county from the rest of the kingdom. The Yare, the Bure, and their tributaries, which discharge into the sea on the eastern coast, also flow through marshes which occupy a considerable extent, and form an interesting and valuable feature in that great variety of soils for which Norfolk is as much as any other county in England remarkable. Any classification of the soils of Norfolk, for the purpose of conveying an idea of the character of the land throughout, can only give an approximation to the truth, as in the same farm, and often in adjoining fields, the greatest difference prevails. In this county the marked features, which elsewhere are stamped upon the surface of the earth by the geological formations beneath it, are not to be distinguished; and the traveller has some difficulty in collecting from the variable conditions of the land a sufficiently clear and definite conception of its character. The light sandy lands, however, may be described as prevailing in the northern and western districts. They differ considerably in quality, being sometimes, as at no great distance from Thetford, blowing sand, and in other places possessed of more natural fertility. They rest upon a substratum of chalk, which crops out at different points. Into this portion of the county there extends northward from Cambridgeshire, to King's Lynn, a strip of fen land, which is found very useful by the large light-land farmers. The central and eastern parts of the county generally consist of loamy soils, varying in quality, being here and there stiff and difficult to manage, but generally light, and incumbent on a marly clay. In this district principally, and especially towards the south-east, are found those extensive marshes to which we have already alluded. The general appearance of the country in Norfolk is flat and unpicturesque, the undulations of the surface not being sufficient to relieve the eye, while the luxuriant effect of rich woodland is not always to be met with. Indeed, the county would be regarded as rather uninteresting in its external aspect, were it not for the evidences of careful cultivation and the pleasing tokens of human industry so frequently and prominently brought before the eye of the traveller. Open fields, divided by neatly-trimmed hedges, and tilled with garden-like precision and cleanliness, must always be agreeable; though, on the other hand, Norfolk has much indifferent husbandry still remaining, many negligent farmers growing each year crops of weeds as well as corn. The climate, as may be imagined on the eastern coast, is dry throughout the year, and cold and biting winds prevail during the winter and early in spring. On a review of all these circumstances of situation, soil, and weather, calculated to have a powerful influence for good or evil on the agriculture of Norfolk, it will be understood how much enterprise, skill, and capital must at some time or other have been called into play to found here a system of cultivation, the merits of which have been so generally recognized. It was necessary to give fertility to sandy wastes fitted only for rabbit warrens, to drain marshes and fens which yielded nothing but snipe-shooting and the ague, to substitute for inferior breeds of live stock produced upon an inferior soil those descriptions which would yield a quicker and larger return; in short, to create a new Norfolk out of the materials of the old. The process by which this task was accomplished is, at the present moment of agricultural depression, so instructive, that though in some degree a departure from the contemporary character of our inquiries, we do not hesitate to devote some space to a description of it. The most singular feature in the change is, that it was mainly effected by the well-applied industry and capital of one man. When the late Earl of Leicester entered on that course of improvement which will render his name imperishable in Norfolk, he was plain Mr. Coke, a country squire, with a large estate, the average rent of which was about 5s. an acre. Fifty years of undeviating attention to the interests of this estate and the welfare of his tenants enabled him to see the rents legitimately raised to the extent of from 20s. to 25s. an acre; to see his land farmed by men of capital, enterprise, and skill, and to find that not only he and his tenantry shared in the advantages of the system pursued by him, but that it had been taken up by the agriculturists of Norfolk and of the country at large, and was doing incalculable benefit wherever it spread. Mr. Coke came into possession of his estate in 1776. Shortly after, some land which now forms part of Holkham Park fell into his hands, from the then occupant refusing to give 5s. an acre for it. That accident made Mr. Coke a farmer. Feeling his want of experience in such an occupation, he founded those annual meetings which afterwards expanded into the Holkham sheep-shearings. He gathered around him the most eminent practical agriculturists he could find. He secured the services of Mr. Blakie as a steward. He established in practice the principles of relieving weak soils by a rotation of crops, of increasing their fertility by raising the quantity of live stock kept, and by the use of artificial manures, and of improving their mechanical texture by claying, marling, and other similar processes. After a long course of experiment and observation, he ascertained that Southown sheep were preferable to any other, and accordingly the wandering Norfolk breed was superseded for it. Devon cattle were also brought into favour by him instead of the "home breeds." The change to Southdowns has now been accepted generally throughout the county, but that to Devons only partially. The important point, however, that of carrying a large stock upon farms, has not been lost sight of, and thus, through Mr. Coke's exertions, has been developed that system which collects so many lean cattle annually in the eastern counties to be fattened and disposed of at Smithfield, between the months of January and June. It was by these means that Mr. Coke, afterwards created Earl of Leicester, was enabled to accomplish what he might well boast of, that he had converted West Norfolk from a rye-growing to a wheat-growing district. He accomplished all this at an immense outlay. He is said to have expended nearly £400,000 in the erection of substantial farm buildings throughout his estate. Knowing that men of capital and intelligence would not embark in any enterprise which would not secure to them the prospect of a profitable return, he gave his tenants long leases on liberal terms, being content himself to part for a time with his hold over the land, and prepared to see those who occupied it become prosperous and wealthy, provided they carried out an improved system of cultivation, by which he would be also ultimately benefited. The success which attended his plans speak for itself. We do not say that similar results might not have been achieved without leases, or by different arrangements; but it is a striking fact that the method adopted by him drew from his tenants an expenditure of capital in permanent improvements, in the purchase of artificial food and manures, considerably larger in the aggregate than his own, and that they admit this outlay, calculated by some of them at upwards of half a million, to have been remunerative to themselves, as well as beneficial to him. Such is an outline of the method in which the Norfolk system of farming became developed. By it tracts of land previously almost worthless, are now made to produce the finest crops, but the immediate advantages to individuals are hardly to be estimated in comparison with the impulse which has thus been given to the cause of agriculture generally. Leases for 21 years are now common over Norfolk, and the system of cultivation which originated at Holkham has not only been extended throughout the county, but has, in some of its leading features, been reduced to practice in many other parts of England. One marked result arising from it struck us forcibly, viz., the superior class of farmers to which it has given rise. The tenantry of Norfolk are fully alive to the necessity of enterprise and diligent attention to the management of their farms. They readily acknowledge that agriculture is still in its infancy, and that the resources of the soil are capable of immense expansion. They anticipate that when the present crisis has passed away, improvements will go on more rapidly than ever. It is the suffering and ruin of the transition state which troubles and alarms them. They do not seem to think that as yet in Norfolk the agricultural interests have been much injured by free trade, as, though prices have been unusually low, the last harvest was very abundant. The small farmers, with insufficient capital, and the small proprietors who occupy their own lands, and are already embarrassed, will, it is said, suffer most. The large farmers are generally believed to be secure against immediate pressure, and in that respect they appear to be much better able to meet the times than in 1822, when, on Lord Leicester's estate alone, 10,000 acres changed hands.

In the neighbourhood of Thetford we visited an extensive light land farm on the Duke of Grafton's estate, which may be taken as an instance of management common to both Suffolk and Norfolk. It is about 1,700 acres in extent, one half being under the plough, and the other half unbroken heath and pasture. In many respects it resembles the Down farms of the southern counties, saintfoin being grown regularly as a hay crop, and the system of folding the sheep on the cultivated land at night, and driving them a mile or two to the pastures during the day, being steadily carried out. 800 acres are managed on the four-course system. For turnips the ground is dressed with artificial manures, the dung being reserved for the wheat crop. 6½ cwt. of rape dust, or 2 cwt. of guano, or 16 bushels of bones, are reckoned equivalents, and one or other of these substances is applied to the turnip crop. It is sown in ridges 27 inches apart. The greater portion is consumed on the ground by sheep, and part carried home to the farmyard. To secure the roots from frost four rows from each side are thrown into a central row, and covered with earth by the plough. They are easily picked out when required. Two classes of sheep stock are fed with turnips—first, a lot of 500 fattening sheep, which receive cake and beans daily, besides having their turnips cut and placed in boxes; and second, the breeding stock of the farm, 900 ewes in number, which are folded on the turnips at night, and driven to the heath during the day. When the turnips are consumed, the land is sown with barley and seeds. A small portion is sown annually with saintfoin, at the rate of 3½ bushels an acre. The seeds are partly mown and partly folded over and fed. They are then manured with a compost of dung and earth. The earth, which is turf cut from the heath, full of vegetable mould, is carted on to the seeds during the winter, when the teams are not otherwise occupied, and laid in heaps conveniently placed for future distribution. Dung is afterwards mixed with it in equal bulks, and the compost is laid on the land as a manure for the wheat at the rate of 20 loads an acre. The layers are thus dunged as far as the compost goes, and what remains is folded by the sheep, fed on cake also. The quantity of stock kept on this farm is 900 ewes constantly, 500 fattening sheep in winter, and 40 bullocks in the yards. The bullocks are fed loose in open courts with warm sheds. They are each receiving daily, at present, 7lbs. of cake, three-quarters of a peck of meal, one bushel of cut mangold wurzel, and saintfoin hay. The horses are worked eight hours a-day in summer, in one yoking, leaving the stabling at 6 o'clock in the morning, and returning home about half-past 2. In winter they start as soon as they can see, and stop at half-past 2. When they return to the stable, one man takes charge of his team of six horses, cleaning and feeding them, which is reckoned his sufficient occupation for the rest of the day: and, as seldom more than two horses are used in a plough, the other two men, now disengaged, are employed after they have dined at any other work about the farm till 6 o'clock, which is the routine management of a well-conducted light land farm on the borders of Suffolk and Norfolk.

On the Duke of Grafton's estate the rent of labourers' cottages is charged very moderately, 1s. a-week, or 20s. a-year, being the rule in the villages which are the property of the Duke. In others it rises to £3 or £4 a-year. Labourers have in many cases to go a long way to their work, on account of the scarcity of cottages on the large farms. On the farm just mentioned there are two labourers regularly employed, who walk every day from Thetford and back, 9 miles, or 54 miles a-week.

To the east of Norwich, and between it and the sea, lies a great extent of fine land. Along the hollows the waters of the Bure and Yare find their way to the sea at Yarmouth, passing many thousand acres of marsh land, of which an immense extent is still unreclaimed. Windmills are chiefly used for pumping out the water from those marshes which have been embanked. After a marsh has been embanked and pumped dry, the soft spongy soil consolidates, and subsides several feet below the level of the river. Ditches are formed throughout it, which convey the water to one point, where, by means either of a steam-engine or a windmill, it is pumped over the bank into the river. The whole cost of embanking, ditching, and erecting a steam-engine is said not to exceed £10 an acre in situations at all favourable for the operation; and as at such an outlay a worthless and unwholesome marsh may be converted into rich grazing ground, it is surprising that so much of this yet remains to be done in a county so celebrated for its agricultural progress as Norfolk. If the new Government drainage loan can be applied to this purpose, it could not probably be laid out in a more profitable manner.

At Horning, in this district, we visited the extensive grazing and arable farms of the Messrs. Heath. On their marsh farm, 700 acres in extent, they keep during the summer 400 bullocks and 700 sheep. Having large arable farms adjoining the marsh, the stock is wintered on them and turned out to the marsh as soon as the grass is ready, where part is fattened and sent direct to Smithfield from the grass, and part is brought on to be finished in the yards as prime fat for the Christmas show. The best polled Galloway Scots are grazed here, as they have been by the Messrs. Heath for a long period of years; but the quality now sent to Norwich is reckoned very inferior to what it used to be some years ago. They are, therefore, now going more into Herefords and Welch runts, both of which, in the order just mentioned, they reckon superior for their purpose to any other breed. Having land of very rich fattening quality, they purchase animals which are nearly fat to finish them; and their great aim is to get stock of the best quality of its own breed, and to "dwell on it," as such is sure to pay, and to pay most for the last month of its keep. In the yards the cattle are not treated so profusely to cake as in some other parts of the county, a larger proportion of roots being given to them. Those, however, which are being prepared for the Baker-street show are fed without stint. They are beautiful specimens of their several breeds, Hereford and Galloway. On their arable lands, which are of fine quality, dry and friable, the Messrs. Heath do not restrict themselves to the four-course, or even to an alternation of white and green crops. They frequently take wheat after wheat, or oats after wheat, or barley after wheat, and find that by liberal treatment of the soil they can do so without injury to it, and with manifest advantage to themselves. In the Blofield Hundred we found the same practice followed by Mr. Tuck on his own property, and were informed that in all cases where the land is farmed by its owner, or where a rigid adherence to rotations is not enforced, the four-course is scarcely ever adhered to. On the farms just mentioned the appearance of the soil and the crops indicated clean cultivation and a high state of fertility.

The marsh lands of East Norfolk are of very various fertility. For the first eight or ten weeks cattle thrive and swell out greatly upon them, but after that they do not continue to progress in the same way; in fact, they seem to require a change of food. This may perhaps arise from the nearly uniform character of the natural marsh herbage, which in that respect differs from the natural herbage of a rich meadow, containing a great variety of grasses, early and late, the one springing up as the other begins to fade.

STOW-MARKET, SUFFOLK, April.

The county of Suffolk, with reference to the character of its soils, may be divided into three sections, each maintaining a distinctive character. On the eastern coast lies a narrow track of sandy land, mixed with shells and other fossil deposit, interspersed with salt marshes, and varying greatly at different points in the amount of its fertility. In some places it is a light barren sand not worth 5s. an acre, while in others the rent rises to 28s. The second description of soil extends over by far the largest proportion of Suffolk, occupying the entire central and south-western districts, and consisting generally of clayey loam, resting on a subsoil of marl, chalk, or clay, and presenting in consequence a considerable variety of texture. The local term applied to it is "heavy land," in contradistinction to the "light land," which is found on either side of it. The third section into which the soil of Suffolk may be divided lies on the north-west side of the county, and a large part of it is very inferior in quality, being a blowing sand on a chalk or chalky clay subsoil. This land was a sandy waste in the time of Arthur Young, but has since been to a great extent broken up by the plough. The lighter soils of Suffolk, both on the eastern and western sides of it, are generally held by large farmers, who hold, in conjunction with their tenements, portions of fen and moorish land. On the heavy lands farms are generally small, though there are some exceptions to this. They seldom exceed 300 acres in extent, and are sometimes not more than 100 and even 50 acres. The large holdings are generally in the possession of men of capital, while the small farmers are said to be ill-provided in that respect, and suffering from the pressure of the times. They are also in most instances tenants from year to year, which is not usually the case with the large farmers. The latter generally have leases varying in their duration from 7 and 8 to 14 years, but seldom extending beyond that period. Farm buildings throughout Suffolk being erected by the tenant, principally, if not entirely, at his own expense, are made in a very unsubstantial manner; the side walls being of wood, the roof thatched, and the whole requiring constant repair, and being a fruitful source of inconvenience and waste. The cattle sheds, the barns, and, in fact, all the premises, are deficient in economical arrangement. Some of the more modern buildings are constructed of clay dried in blocks, but not burnt, which is found to make a very cheap and durable wall.

The chief feature of Suffolk agriculture is the success with which heavy-land farming is carried on. A large proportion of the county, embracing nearly all the central part of it, consists of what is usually termed *strong* land, in contradistinction to turnip and barley land. This is not a continuous tract, however, as it is everywhere interspersed with fields of a more friable texture, which are found very valuable when held along with a clay land farm. The clay land forms not a flat, but a gently undulating country, affording ready means for drainage. The soil contains generally a considerable admixture of gritty sand and some pebbles, while in the subsoil in many cases are found beds of chalky marl, which after exposure to the air are applied with much advantage to the surface. Drainage is of course the primary improvement on this description of land, and, as in scarcely any instance has the landlord hitherto contributed any portion of the outlay, this is effected in the cheapest manner. Drains, two feet deep and 15 feet apart, filled with bushes, are giving place to drains three feet deep and 24 feet apart, still filled with the same material. The cost of the operation in labourers' wages is under 30s. an acre, and the benefits are expected to last for a 14 years' lease. The land is then gone over again, the direction of the drains being now made so as to cross obliquely the old drains, and thus to *bleed* such as still remain open. As a long fallow is regarded a routine operation twice or thrice in the course of a short lease, so is draining looked upon as a matter of regular recurrence once every 14 or 16 years. There can be little doubt that if executed in a careful manner with tiles the work would be made complete, and this constant draught on the tenant's capital rendered unnecessary. For main drains pipes are generally used at present, and in all cases where it is found desirable that the work should be permanent, pipes or tiles are used throughout, and the drains cut from three to four feet in depth.

By the terms of agreement a portion must be wrought in naked fallow, and that receives during the summer the usual course of ploughings, being laid up in stetches for the winter, and sown with barley the following spring. The whole of this division, after roots and fallow, should, in strict terms of lease, be sown with barley; but wheat is very frequently substituted after the root crops. Barley is drilled in on the stetch in spring, and the ground is then sown with a peck of red cloverseed per acre. In some cases this is covered slightly by having the ground hand-raked, which is done for about 7d. an acre. One-half of this division is usually sown with clover; the other, after the corn crop being removed, is prepared for beans in the same manner as already described for roots. Every crop is repeatedly horse and hand-hoed, and the soil kept remarkably clean. 32 bushels an acre of wheat, 44 of barley, 36 of beans, may be reckoned average crops on the better description of heavy lands, where the details just mentioned are carefully pursued. The management of stock is not attended with anything like the same success as the corn crops; and this department is felt by the farmers as not only barren of profit itself, but also trenching heavily on the returns of the other. The land being chiefly under the plough, the stock of cattle kept is usually purchased in autumn, to be fed during the winter and sold off in spring. They are put into large yards supplied abundantly with straw, with 14lb. to 18lb. a-day of corn and cake each, and one to two bushels of mangold wurzel. As few of the farmers breed their own stock, they usually comprise many varieties: polled Galloway Scots, shorthorns, Irish cattle, &c.; and as the breeders of the best description of cattle in their native districts are now, by the extension of green crops and facilities of rapid communication, becoming the feeders also, it follows that the worst specimens of each breed now find their way to the feeding counties. The quality of the polled Scots now sent to Norwich is quite inferior to what it used to be, and nothing pays worse than a bad animal of this breed. Beginning with bad animals of their several kinds, the Suffolk farmers grudge no expense in trying to make them fat. Each bullock costs for its food not less than 40s. a month, and as the returns for the last two seasons have not probably exceeded 20s. in the increased value of the animal, there is an apparent loss of £6 on each animal for the winter's keep. To the manure the farmer looks for this loss, but a little consideration will show that this is a most expensive mode of making manure. On a farm of 350 acres we shall suppose a stock of 40 cattle to be fed during six months of winter. At present prices, and with the usual mode of feeding, these lay a charge of £240 on the manure. These 40 cattle make about 1,000 yards of manure; but at least one-fourth of this must be deducted for the value and bulk of straw. We have thus 750 yards of dung, costing £240, or nearly 6s. 6d. a-yard. This applied at the rate of 15 yards to an acre will manure 50 acres of land. But if the same sum were expended on guano, superphosphate and rapecake, at the present prices of these articles, 120 acres of land could be annually manured at the rate of 2 cwt. per acre of each of these substances, or 6 cwt. altogether, with the certainty, in our opinion, of a much heavier crop from each acre than would be yielded by the application of 15 yards of manure. By the adoption of this plan it would unnecessary to tread down the straw in yards merely for the purpose of getting it converted into dung, as the greater amount of green crops would admit of a double stock of cattle, and would afford to these a supply of much less expensive food. This, however, leads to a large question, which, as it involves a change in the stock-farming altogether, we have not at present space to enter upon.

On the farms of Mr. Casson, of Dennington, who holds upwards of 5,000 acres of land, 2,000 of which are of the heavy land already described, we found some variations in the management adopted. On one farm, which is his own property, he is trying whether he cannot on the heavy land grow crops every year, without any naked fallows or root crops, which are at present found so unremunerative. The course he follows here is to have (1) a bean crop, followed by (2) wheat and (3) barley, which is sown with (4) clover, and followed by (5) wheat and (6) barley. Every crop is most carefully horse and hand hoed, all being drilled, and the land is kept quite clean. The practice has not been long enough followed to be accepted as proof of its correctness; but this much has been ascertained, that by carefully horse and hand hoeing every crop, weeds are extirpated, and the yield of each of the grain crops has been quite equal, and of barley generally superior, to what is got under the regular four-course. For the work of his different farms Mr. Casson keeps a stock of about 120 horses. Two-horse ploughs are universal in both light and heavy land; and the land is ploughed, when necessary, with a deep strong furrow. The whole management of this extensive holding is conducted with great neatness and skill. The bill for oilcake, &c., for feeding sometimes exceeds £1,200 in a year; and an equal sum is expended on artificial manures.

Much of the heavy land has been broken up from pasture within recent years. The native vigour of the soil in such cases is very great, and it is usual to take several crops of wheat in succession without any manure. The mode adopted in breaking up the land at first is to pare and burn it, at a cost of about 25s. an acre. If this can be done early enough in the season, a crop of oats is taken. If too late for oats, the land is sown with rape and fed off. Wheat is then taken in succession—four or five times—and great crops are reaped. On the farm of Mr. Bond, of Earl Soham (which is very neatly and well managed), the second wheat crop yielded forty bushels an acre, weighing 69lbs. per bushel. On this farm, besides the usual careful management of all the corn crops, the clovers are gone over by children and every weed picked out by land.

In the cultivation of the lighter soils of the county the usual details of the four-course system are followed out with a peculiarity in the preparation of fallows for green crops which has arisen from an absurd clause in the leases and the mode of payments between incoming and outgoing tenants. Farmers are required to plough their winter fallows five times, no matter how light the land may be, even though it should be a blowing sand; and, where covenants are strictly enforced, this unnecessary expense must be incurred. But the hardship is peculiarly great to an incoming tenant, who must pay his predecessor for each of these operations, though they are in most cases rather injurious than otherwise. The year's rent and rates are likewise charged, so that the entry to a large light soil farm is a very expensive matter; the whole amounting to a charge of about £5 an acre on the fallow division. Now, if this were an absolutely necessary expense, we should have less to say against it; but on the farm of Mr. Bond, at Wickham-Market, we found that his light land is only ploughed once in preparation for roots, which ploughing is delayed till spring. The land turns up finely pulverised; it is perfectly wrought, and produces crops which contrast favourably with those of any farm managed according to the usual prescription. We had an opportunity of ascertaining the opinions on the point of several of the most intelligent light land farmers in the county, and found them unanimous in their condemnation of it Manure is used rather sparingly on the light land farms, and very moderate green crops are grown. So little is the turnip crop valued, that in many places it is sold for consumption by sheep at £1 to £2 an acre, and sometimes even less. On farms where breeding stocks of sheep are kept, it is thought that turnips which have been manured with guano, or other forcing manure, are injurious to the ewes; and accordingly, to guard against this danger, the turnip crop on such farms is sown without any manure. It is not easy to understand the *rationale* of this; but it may be, perhaps, owing to to the more succulent nature of the root and its stronger growth in spring, purging poorly fed stock, and causing them to "warp" their lambs. On a farm managed on this plan we found the tenant complaining of meagre crops; but it is difficult to see how they could be anything else. A light sandy soil, turnips with no manure, eaten off by a breeding flock of ewes, are not the most favourable preparations for remunerative corn crops.

In the arrangement of farm buildings the occupier of a large farm prefers having several barns and feeding sheds at different points of his farm to having them all placed in one central position near his own house, and more immediately under his eye. He argues that a great saving of cartage ensues from this practice; as the corn crops are stacked at a barn near where they have been reaped, the roots are carried to a yard at no great distance, and the manure from both is returned to the land without heavy cartage. To suit this arrangement of buildings, portable thrashing machines, whether of steam or horse power, are most valued in the county.

The mode of conducting harvest work is somewhat peculiar. It is usually done by task work. All the labourers are joined in the engagement, and the earnings divided among them. Seven shillings an acre for cutting and securing the crop, inclusive of wheat, barley, and beans, is paid by some farmers. This usually includes, also, the hoeing of the late turnip crop twice; which is done in the mornings, or in weather not suitable for corn harvest. For this sum the people cut the crop, pitch it into the carts, and build it in the rick-yard. The carters are paid separately, and the thatching is done separately by task work. At this rate of payment they earn £1 a week, but work hard for it.

Soot is used pretty extensively as manure, especially on farms much overrun with game. It is believed to protect the crop in a considerable degree by rendering it distasteful to the game. On asking a farmer the present price, he said it was rather scarce this season in his neighbourhood, on account of a large demand from Lord Rendlesham, who requires it for application to a game farm which has been lately thrown on his Lordship's hands.

The farm carts seem very cumbrous and heavy; and might with much advantage have some of the skill which is so conspicuous in the drills and horse-hoes applied to their construction. Ploughs are generally of wood, with the wearing parts of iron, and almost universally with only one handle, and a cross pin by which to guide.

THE MALT-TAX.

Although we do not profess to take any leading part in the discussion of subjects bearing very closely on the politics of agriculture, we have several times alluded to the unfair character to the farmer, at least, of the malt-tax. We are not aware of any tax on the manufacture of a raw material of British production which amounts to as much as the value of the article itself, but the duty on malt; and though a fiscal and monetary question, it is one which may materially operate in practical farming. It prevents the farmer from malting his grain for his cattle if he pleases to do so, and it also much enhances the cost of the beer he brews for his labourers—in harvest and hay time at least, when labour is severe and prolonged, and the muscular power has to be drawn out and concentrated—a necessary of life.

Now whether it would do much or little good to the farmer, we are not now about to stop and inquire; but we caution the Government that the evil is so palpable and anomalous, that it will cure itself. Science will be set to work by Necessity, the mother of Invention; and that which has cooked the bones for turnips—which has rescued the organic remains of previous races, and made them into subsistence for the present—will doubtless soon step in, and defeat all those stringent fiscal regulations, which impose restrictions so palpable and injurious to the article of malt.

Amongst these we are glad to place the suggestions of a very scientific gentleman, whose letter we insert entire on this subject, and which contains a very important practical mode of avoiding the necessity of paying this tax imposed between the beer drinker and the producer, by scientific processes alone. He says:—

"A correspondent of *Bell's Weekly Messenger*, of the 30th ult., says, he is informed that good ale can be brewed from mangold wurzel; if so, he should feel obliged to any of its correspondents to inform him of the process, as he is anxious to avoid as far as possible that abominable impost, the malt tax. I quite agree with the correspondent of *Bell's Weekly Messenger*, in thinking the malt-tax a most abominable impost: every farmer in the kingdom ought to petition Government to repeal it. Can there be anything so unfair to the farmer as to retain the duty on malt, when only a few years ago it was thought necessary to protect, by duty on foreign grain, the growth of barley in this country? I cannot give the correspondent the information he requires; but I can inform him, and your readers at the same time, how they may make good ale from barley without malting. Let him get a tub large enough to hold as much water as would be required to make a sack of malt into ale; it must be provided with a leaden pipe from a steam-boiler, which must go down to the bottom of the tub: this pipe is for the purpose of heating, or rather boiling, the water by steam. When the quantity of water that would be required to brew a sack of malt is put into the tub, then add 3 or 4 lbs. of oil of vitriol (sulphuric acid), turn on the steam, and when it boils add, by degrees, a sack of barley which has been ground into meal; continue the boiling after this is done, for about two hours; he will then find that all the starch contained in the barley meal will be, by the acid, converted into saccharine matter (and thus save all the loss which the barley sustains by the process of steeping, sprouting, drying, &c., &c.). To the boiling liquor he must add 6 or 8 lbs. of common whiting (carbonate of lime), which has been previously mixed with 3 or 4 quarts of water: this should be passed through a fine sieve into the boiling liquor. The hops may now be added, and the boiling continued for half-an-hour after the whiting has been added, which is done to neutralize the free acid, and will in some measure supply the liquor with carbonic-acid gas; it may then be allowed to settle, or be filtered. After the liquor is drawn off, the dregs may be washed with a little more water, and boiled; after it is settled it may be drawn off and mixed with the first liquor, and when sufficiently cool add yeast, and ferment it in the usual way. After it has been in the barrel a few weeks he will find he is in possession of some fine pale East India ale. I am yours respectfully,

Jan. 15th, 1851. A Farmer.

Now though we have not tried the process, we think so highly of our correspondent, that we are certain he would not have made the suggestion on any uncertain data, and shall be glad to hear of any trials which may be made by any of our readers.

We think it highly probable, moreover, that the suggestion is sound, from the fact that in distilleries barley is added to malt, for the purposes of distillation, and it is well known that sulphuric acid has the power of converting starch into sugar. And if so, might not the same acid which cooks the bones for plants, be able to cook the starch of corn into sugar for animals?

Will Mr. Hudson, of Castle-acre, or Mr. Fisher Hobbs, who have been so successful with their malt feeding on a small scale, try this? or will Mr. Mechi, or Mr. Huxtable, who are so fond of experimentalising, give us the result of some trials on a small scale, with raw and vitriolised barley? If there is any truth in the general principle that sugar is more fattening than starch, we do not see how the mere mode of its change can effect its practical results; and though there may not be much in the notion, it is clearly one of those which demands at least an experimental trial.

In these times the least advantage is not to be lost sight of, and if the vitriolising of food for stock will be of any great advantage it will be a considerable boon to the farmer; while if the vitriolising of barley will produce good beer, it will at once and for ever of itself repeal the malt tax—a tax more kept on than anything else because it produces a large revenue. — Gardeners' and Farmers' Journal.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Weekly Council was held at the Society's House, in Hanover Square, on Wednesday, the 11th of December. Present: His Grace the Duke of Richmond, K.G., President, in the chair; Lord Portman; Lord Ashburton; Hon. Dudley Pelham, M.P.; Mr. Dyke Acland; Mr. Barugh Almack; Colonel Austen; Mr. Raymond Barker; Mr. Biddulph; Mr. Bosanquet; Mr. Bramston, M.P.; Mr. Brandreth; Mr. T. Brown; Mr. W. Brown; Capt. Wentworth Buller, R.N.; Mr. French Burke; Mr. Catherall; Colonel Challoner; Mr. Cox; Mr. Evelyn Denison, M.P.; Mr. Dyer; Mr. Garrett; Mr. Brandreth Gibbs; Mr. Grantham; Mr. Hamond; Mr. Fisher Hobbs; Mr. C. Wren Hoskyns; Mr. Hudson (Castleacre); Rev. A. Huxtable; Mr. Cuthbert W. Johnson; Mr. Jonas; Mr. Kinder; Mr. Lawes; Col. M'Douall; Captain Moorsom, R.N.; Mr. Mainwaring Paine; Mr. Pusey, M.P.; Mr, Shaw (London); Mr. Shelley; Mr. R. Smith; Rev. J. R. Smythies; Mr. Thompson (Moat Hall); Mr. G. D. Trotter; Mr. C. Hampden Turner; Mr. Turner (Barton); Prof. Way; and Mr. Jonas Webb.

The following new members were elected :—

Barber, William Mills, Langley Broom, Colnbrook, Bucks
Clunes, Major John, Woodfield, Pembroke
Gamble, David, Gerard's-bridge, St. Helen's, Lancashire
Green, John, Knipton, Grantham, Lincolnshire
Leach, John, Pembroke
Simpson, George, Marton, Bridlington, Yorkshire
Simpson, John, Field House, Hunmanby, York
Tredwell, John, Leighham Court, Streatham, Surrey
Tredwell, Thomas, St. John's Lodge, Upper Norwood, Surrey
Ward, G. B., Great Bentley, Colchester, Essex.

Guano.—Captain Wentworth Buller, R.N., adverted to the communication lately made by Lord Palmerston to the Council relative to the supply of guano from Peru at a reasonable rate. In proof of the vast importance of guano he instanced the example of a farm in his own hands, consisting of 80 acres of poor land, for the most part lately reclaimed from heath, and rented at 6s. per acre. For six years past the whole of the corn and hay together, with about 80 tons a year of Mangold Wurtzel, Carrots, or Potatoes had been removed from this ground, and not a particle of any kind of manure restored or used, except guano and a little marl applied to the lightest ground, and 10 loads of dung per acre, applied in one of the six years to three acres of Potatoes. The White Turnips have always been fed upon the ground, but everything else has been taken to a farm two miles distant. During the whole of these six years the crops upon this land have been steadily increasing. Land, which six years ago was not in itself capable of producing 10 bushels of Barley per acre will now produce from 30 to 40.

In answer to various questions, Captain Buller stated that he applied guano to all the root crops, at the rate of about 5 cwt. per acre for mangold-wurtzel or carrots, which were to be taken off, and at the rate of 3 cwt. for white turnips. That he took five crops in four years, and that he considered he had grown this year 140 tons of mangold-wurtzel and carrots from seven acres of land. In reference to the supply of guano, he stated various particulars as to the discovery of the island of Ichaboe, and urged upon the Council the expediency of entering into communication with the Admiralty and the Royal Geographical Society, and endeavouring with their assistance to ascertain whether supplies of guano could not be obtained from other quarters besides Peru. It appears that the supply of good guano is limited to those regions of the globe in which little or no rain falls. These rainless regions are only found for two or three degrees on either side of the tropics, and are generally distinguished by deserts or that sterility which follows the absence of rain. Thus the Great Sahara under the northern tropic in Africa, and the Little Desert under the southern tropic, where the island of Ichaboe was discovered. It was from the prevalence of deserts that these parts of the world were so little known. Ships rarely visited such coasts, and much of the coast of Africa under the northern tropic was, for this reason, still very imperfectly known. It was stated in several of the voyages of the Portuguese and other of the early discoverers who had visited this coast that sea-fowl abounded in various parts, and it was especially mentioned that in the Bay of Arquin, near Cape Bor, they were so abundant that the crews had filled two boats with the eggs; and as this was a rainless region, there were strong grounds for supposing that guano in considerable quantities existed in the Bay of Arquin. If this were so, it would be so much more valuable, in consequence of being within so short a distance of this country.

A few years ago a merchant in London had been induced by a statement of these facts, and the evidence taken from various old voyagers, to send three ships for the purpose of exploring, and if possible loading with guano from Arquin; but on the arrival of the first ship, a boat having been incautiously sent on shore, the crew had been attacked by the Arabs, and the whole either killed or taken prisoners. Upon this disaster the ships had all sailed away and loaded elsewhere, while the existence of guano in this spot still remains doubtful. Shortly after this occurrence he believed that the Admiralty had dispatched a vessel of war to Arquin, to endeavour, if possible, to rescue some of the boat's crew; and it was possible they might have made some inquiries, and have some information to give respecting guano. There were many other places, as parts of the Red Sea, and the Gulf of Persia, which were known to be rainless, and which were scarcely ever visited on that account; and he thought it would be very easy and very desirable for the Admiralty to give general instructions to the captains of all ships employed in or near those stations to make inquiries, and report to the Admiralty as to supplies of guano. The existence of a large number of sea birds (especially the penguin) in a rainless region were indications which could scarcely be mistaken.

The thanks of the Council were voted to Captain Buller for his kindness in making this communication.

Captain Moorsom and Mr. Robert Smith then favoured the Council with important information connected with the supply of guano to this country.

Mr. Hudson, of Castleacre, stated a case in which an analysis by Professor Way, of manure offered to him for sale, had proved of the highest importance in determining the value of the manure, and the price at which it ought to be supplied.

The Chairman, Mr. Shaw, Mr. Turner, Colonel Macdouall, Mr. Jonas, Mr. Acland, and Mr. Paine, detailed to the Council their experience in the purchase of guano.

Nipâl Barley.—Capt. C. R. Drinkwater Bethune, R.N., C.B., of the Harbour Department in the Admiralty, transmitted to the Council a small supply of skinless Barley, weighing about 200 grains, and marked "Nipâl, 1850," received from his brother, a member of the Society, at present residing in India. The Council ordered their best thanks to be conveyed to Capt. Bethune, for this attention to the objects of the Society; and at their request, Mr. Shelley and Mr. George Turner undertook to try the cultivation of this Barley on their respective farms in Sussex and Devonshire.

Creasoted-Fish Manure.—Mr. Bethell, of 8, Parliament-street, transmitted to the Council the following statement of the trial of empyreumatic fish-oil manure on the growth and preservation of Potatoes, addressed to him on the 29th of November last by the manager of the Orphanage establishment, near Hounslow.

> "I am glad to be able to inform you that the boys of the Orphanage have dug up all the potatoes, and that they are all entirely free from any symptom of the disease; which I believe is due entirely to the creasoted fish, as almost all the crops in this neighbourhood were more or less struck with the blight or disease, whilst our plants remained green and perfectly untouched. The 20 acres of ground which we planted were of a very poor and gravelly soil; so poor, that the previous occupier declared that nothing would make that land produce potatoes. We planted in it Regents and Forty-folds, with about 8 cwt. of creasoted fish per acre, and without any other manure whatever. In planting, the boys dropped a piece of the fish in the furrow near the potato set, and the plough following earthed them over. The crop is, as near as we can estimate it, about 100 tons, and the potatoes are all of excellent quality, and without a speck of disease. I hope to plant with potatoes a much larger extent of land next year, to all of which I will apply the fish; but, as the land is very poor, I intend putting 10 or 12 cwt. of fish per acre, as we found that where by accident the boys had put more fish, there the crop was much heavier, and the potatoes larger. I had the curiosity to weigh some of the largest potatoes amongst those that had by accident had an increased quantity of the fish-manure, and I found some of them to weigh 1¼ lb. each, and one 1½ lb. I have kept them as extraordinarily large. I anticipate an extraordinary crop next year, and I shall astonish my neighbours even more than they have already been."

Mr. Bethell also favoured the Council with specimens of the Potatoes themselves, which were of healthy appearance, and of large size, being found on boiling to be of excellent quality, without the slightest taint of fishy flavour.

Animal Carcass Manure.—Mr. R. M. Gillies, of Mark-lane, one of the Governors of the Society, favoured the Council with specimens in stoppered glass bottles, and in various states of preparation, of the new South-American manure, obtained from the flesh and bones of the large herds of wild cattle in that continent, slaughtered for the sake of their hides, after the tallow had been extracted from their carcasses by steaming. This residue was formerly thrown aside as useless; but being well known to possess powerful manuring properties, it has attracted the attention of the South-American merchants, and being well dried previously to shipping, it is about to be imported largely into this country, on account of the great demand and exorbitant price of Peruvian guano. This manure has been analyzed by Professors Anderson and Way, and by Mr. Teschemacher, and found, as might be expected, to contain a large amount of fertilizing matter. It has been applied with great success to the Turnip crops and Grass lands on Colonel Long's farm at Bromley Hill, in Kent.

Ventilation.—Mr. Septimus Braithwaite, of Wareham, Dorsetshire, exhibited to the Council an apparatus used with great success for the last 18 months in France, for the purpose of ventilating stables and farm-buildings generally, by spiral vanes, allowing by their rotation the fresh air to gain an entrance in one direction, and to pass out in another.

Farm Accounts.—Mr. Hudson, of Castleacre, presented to the Council a printed form of accounts he had employed for many years with the most satisfactory results; and which, admitting of being separated, and forwarded leaf by leaf to the various parties employed by him on his several farms, were returned to him filled up at stated times as he might direct.—Mr. French Burke also forwarded to the Council a copy of his new work, entitled, "An Improved System of Farm Book-keeping."

The Council ordered their best thanks for the favour of these communications.

Lord Stanley, of Alderley, transmitted, by direction of Viscount Palmerston, for the information of the Council, a work, received from her Majesty's Consul at Boulogne, on the prevention of Potato disease, by autumn-planting, founded on the six years' observation of M. Le Roy Mabille of that port.—Mr. Strafford, of 3, Camden Villas, Camden-town, presented a copy of the 9th volume of his continuation of "Coates's Herd Book;" containing pedigrees of improved short-horned cattle, illustrated by 11 original lithographic portraits of celebrated animals of that breed.—Dr. Plomley transmitted a copy of his work on the natural history of the Hop fly and its enemies.—Mr. vom Hof sent for inspection various specimens of Wheat grown on very poor land in Kent from seed prepared by Dickes's steeping liquor.—Messrs. Dean and Son presented a copy of their work on Prize Model Cottages; and Mr. Tidd, copies of plans of the Islington Cattle Market, with the proposed additions.—Mr. Dyke Acland presented a copy of his printed letter to Mr. Miles, M.P., containing a proposal for the establishment of annual agricultural meetings, consequent on the meeting of the Royal Agricultural Society at Exeter, to be held successively in different towns of the West of England.—Mr. H. Mayhew transmitted a copy of his report connected with "Labour and the Poor." For these presents, and others made to the Society, including numerous periodical agricultural works, published in this country and abroad, the Council ordered their best thanks to be returned.

A SPECIAL COUNCIL was held on Thursday, the 12th of December, for deciding, agreeably with the terms of the bye-laws, on the prizes to be offered for live stock next year: present, his Grace the Duke of Richmond, K.G., President; Lord Portman, Hon. Dudley Pelham, M.P., Mr. Raymond Barker, Mr. S. Bennet, Mr. H. Blanshard, Mr. Brandreth, Mr. W. G. Cavendish, M.P., Mr. Walbanke Childers, M.P., Mr. Fisher Hobbs, Mr. Hudson of Castleacre, Mr. Shaw of London, Mr. Shelley, Mr. Robert Smith, Mr. Turner of Barton, and Mr. Jonas Webb.

The Council decided on the details and classification of the prize-sheet to be adopted for next year, of which the following schedule represents summarily the divisions and the respective amount of prizes assigned to each:—

Shorthorns	£215
Herefords	215
Devons	215
Longhorns	40
Channel Islands breed	40
Sussex breed	40
Scotch horned cattle ..	45
Scotch polled cattle ..	45
Welsh, Irish, and other pure breeds........	40
Horses..............	270
	1165
Brought forward	£1165
Leicester sheep......	170
Southdowns and other short-woolled sheep	170
Long-woolled sheep (excluding Leicesters)..	85
Sheep best adapted to a mountain district (excluding Southdowns)	50
Pigs	130
	£1770

The Council decided that no "extra stock" should be allowed to be shown next year. They also agreed that the rules and regulations of the Show should be taken into consideration at the Monthly Council in February next.

A Special Council was held on Friday, the 13th of December: present, His Grace the Duke of Richmond, K.G., President, in the chair; Lord Camoys, Mr. Raymond Barker, Mr. Brandreth, Colonel Challoner, and Professor Sewell. The report to be made by the council to the ensuing general meeting of the Society was arranged and agreed to.

The meetings of the Council stand adjourned over the Christmas recess to the 5th of February.

GENERAL AGRICULTURAL IRRIGATION AND DRAINAGE COMPANY

Drainage and irrigation are measures of the highest utility in agriculture. Indeed, it may be said that all our agricultural energies should be devoted to that object.

But works of drainage and of irrigation are not within the easy reach of everybody. They require a pretty considerable outlay, and special information: without which the result would be almost always uncertain. A company offering every necessary guarantee, and devoted especially to undertaking works of drainage and irrigation, would be of signal service to the interests of agriculture.

We have frequently been the medium of recording the desires of the agricultural body, in their appeals for the formation of a company of this description. The central society of agriculture, after hearing an excellent report by M. Batailler, on the irrigation effected by him on his estate of Portail, near Montargis, expressed, in 1849, the same opinion and desire.

Such a company is now established. For a long time past several gentlemen appreciating the excellence of M. Batailler's system of irrigation, and carefully weighing the advantages afforded by drainage, have been engaged in the formation of such a company. We are now in a position to announce its definitive establishment, and publish its programme and regulations.

The director of this great undertaking, M. de Liron d'Airolles, chevalier de la Légion d'Honneur, and formerly a practical agriculturist, has just favoured us with all the documents and necessary information for the purpose of replying, through the medium of the *Echo Agricole*, to the numerous questions which have been addressed to him on this subject.

We will now place these documents before our readers.

"The object of the company is to carry out in France works of irrigation, on the plan of those so much admired in the plains of Lombardy and in Piedmont, and which, wherever they have been skilfully carried out, have secured large profits to the proprietor of the soil, and comfort and prosperity to the people.

"The company will extend its operations, limiting them, however, within the extent of its capital, to all districts which offer the most profitable investment; and advantageous proposals have been already addressed to it from all sides.

"The Committee of Management feel convinced that whatever may be the amount of capital at disposal, it will for very many years be inadequate for the works, which can be beneficially executed.

"*Data on the probable results of the operations.*

"In many localities the value of the soil has been increased ten-fold by irrigation. But the Company will ground its calculations on works executed under more ordinary circumstances, and under a climate which does not join the advantages of a high temperature to those of irrigation. Such an example presents itself in the works executed by M. Batailler, a landed proprietor, and formerly a pupil of the Polytechnic School, on his estate of Portail, near Montargis, where, by an expenditure of

600 francs the hectare,* (about £10 an acre), he has transformed an arid and almost useless soil into rich meadow land.

"These results have been confirmed by numerous reports from the Inspectors of Agriculture, and from commissions appointed by the agricultural committees, and by the administration of the department of Loiret. 'The land on which M. Batailler has been operating'—say, MM. de Sainville and de Montferrand, delegates from the Agricultural Society of Montargis, in their report of the 1st September, 1847, 'was of very indifferent quality, and let at 10 francs the l'arpent métrique or 20 francs l'hectare,' (about seven shillings the acre).

"This rental represents a capital of 700 francs, and it is notorious that these meadows, producing 1,600 bottes† of hay of the first quality, in two crops, are worth more than 4,000 francs the hectare—being an increase of more than 3,300 francs: a sum from *five to six times* greater than the capital expended.

"'To resume,' continue MM. de Sainville and de Montferrand, 'we think that the works executed by M. Batailler are well conceived and executed, and that the application of his system would be exceedingly advantageous in all situations where a sufficient supply of water and a suitable adaptation of the land are to be found. We do not, therefore, hesitate to propose that the gold medal offered for the best system of irrigation be awarded to M. Batailler.'

"The correctness of this example is further confirmed by the precisely similar results obtained, under a colder climate, in La Campine, the Sologne of Belgium, which have been published in a valuable work by M. Mangon, Engineer of Bridges. 'The Government works, and those of the Irrigation Society,' says M. Mangon, 'have already increased the value of some thousands of hectares of land six or seven fold. There are also uncultivated downs in La Campine which have been transformed into meadow land of the first quality, at an expenditure of 600 francs the hectare.'

"'These are,' adds M. Mangon, 'remarkable instances of industrial companies engaging in agriculture. It is highly desirable that a large amount of capital should be employed in the same way in France. We entertain no doubt of the success of this sort of undertaking, judiciously and honourably conducted.'

"The above results are independent of those obtained by the aid of M. Batailler's system of liquid manure.

"MM. Dumas et Payne had long drawn the attention of cultivators to the advantages attending the application of copious irrigation with water charged with some thousandth parts only of organic matter, as a means of accelerating the progress of vegetation in an extraordinary manner.

"M. Batailler has responded to this appeal, and has succeeded in rendering these principles more thoroughly applicable than could have been possibly anticipated; for he not only makes practical use of all the fertilising principles of the *Flemish manure*, but he applies it to the land in irrigating streams in the exactly suitable proportions without the expense of spreading, and consequently experiences no loss of gas and no offensive smell.

"This new process in irrigation has been unanimously approved by both practical and scientific men.

"1st. The Agricultural Committee of Montargis, which has inquired into M. Batailler's plan of irrigation on the estate of Portail, has awarded to him a gold medal.

"2nd. The Central Society of Agriculture, in its sitting of the 7th of February, 1849, recognised the special advantages secured by this method, and declared it deserving of serious attention. A member, M. Payen, cited the example of a similar system of irrigation carried on in the plain of Issy, which produces four or five crops of hay where previously only one was gathered.

"3rd, The Society of Encouragement, in its second sitting of February, 1849, voted the publication of M. Batailler's paper, after a public and highly complimentary approval pronounced by its president, M. Dumas.

"4th. The Jury of the Exposition has awarded two medals to M. Batailler; one from the Report of the Commission on Chemical Arts, and the other on the proposition of the Agricultural Committee.

"5th, and lastly. The Council of Public Health, in its sitting of the 8th of March, 1850, impressed with the importance of the results obtained, recommended a grant to M. Batailler of part of the 30,000 cubic metres of night-soil reserved for such purposes by the city of Paris.

"The company therefore, seconded by the most talented engineers and distinguished agriculturists, appeals confidently for the raising its capital to the friends of agriculture; and to those who wish to employ their money in a manner the most safe, the most beneficial to the country, the most productive of moral good and its substantial advantages.

"M. Batailler has granted to the company the sole use of his system.

"We cannot do better here than quote some extracts from modern writers who have treated on the subject of irrigation.

"*M. Mathieu de Dombasles.*—'Of all the improvements in the means by which the products of the soil may be permanently increased, there is perhaps none more important than irrigation; and yet the practice of this system has been hitherto confined to but a small number of the departments of France. It affords, in fact, a most striking instance of the slow progress made in agricultural arts of the most evident utility.'

"*M. Jaubert de Passa.*—'Who could venture to form a calculation of what the future has in store for France, if irrigation obtains a footing there under the protection of the laws; if new and peaceful channels of labour be opened up for the poorer class; if a more perfect and diversified culture of the land, and an application of irrigating streams, for improving waste lands, retain in their villages these numerous labourers now congregated in populous towns through want, neglect, and many other causes; if more extensive meadows and superior pasturage conduce to the improvement in the breed of horses and cattle, and if the food of the people become more wholesome and more abundant?'

"*M. Héricart de Thury.*—'The law of Angeville is but the first instalment of a more complete legislation on this high and important question of irrigation. There is not, perhaps, in other districts a sufficient knowledge of all the advantages that can be rendered by irrigation, and the influential part it may perform in the destinies of the people."

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* The "hectare" is 11,960½ square yards.

† The "botte" weighs about 11 lbs. English.

"*M. Auguste de Gasparin.*—'At Orange the fifth part of the land is submitted to irrigation. Meadows as beautiful as those of Milan are mown three or four times a-year, and are let as high as 850 francs the hectare. One-third of this sum is expended in the management of the land. These returns equal from three to ten times the revenue of identically-similar soils under ordinary cultivation.

'At Avignon, the water triples the value of the excellent land which surrounds the town.

'At Vaison and at Malancène, irrigation raises the value of naturally-inferior soils to 12,000 and 14,000 francs the hectare.

'At Cavaillon, the waters of the Durance have in some places increased the value of the soil ten-fold. Lands which hardly fetched 500 francs the hectare are valued at 5,000.

'At Sorgues, a sterile country, which was repulsive to the eye of the traveller, has improved a hundred-fold through irrigation. The desert has been here changed, as it were, into the smiling plains of Lombardy.

'M. Taluyers, of Saint Laurent (Rhône) has, with an outlay of only 20,000 francs, formed a meadow of 33 hectares, producing an income of 10,000 francs. The land brought in previously no more than 1,200 francs.

'It is, moreover, with very small outlay that the riches of the soil have been thus opened up. At Cavaillon, close to the banks of the Durance, occurs almost the only instance in which the system has acquired a remarkable development; everywhere else the operations have been mere experiments. An example is hereby, however, bequeathed to posterity, demonstrative of the course they ought to adopt, as well as of its practicability.'

"*M. Nadault de Buffon.*—'France alone requires the formation of at least five million hectares of meadow land to give it the proportion of one to two with land cultivated by the plough. An increase of riches would then ensue to the amount of more than 6,000 millions (£240,000,000), equivalent to a revenue of more than 300 millions (£12,000,000). Thus, notwithstanding the expense incurred, irrigation is one of the most certain elements of wealth to the countries which employ it; a fact easily confirmed by the mere outward aspect of general comfort among the population in irrigated countries, by the cleanliness and convenience of the rural habitations, and by the facility with which the various liabilities are discharged.'

"*M. de Maunay de Mornay*, in his 'Studies on the Irrigation of Upper Italy,' has given a description of the magnificent works executed in that country, with information as to the manner of their construction, and the changes requisite in French legislation necessary to get rid of the obstacles, now frequently invincible, which are opposed to the use of running waters. 'In the present state of things,' says M. de Mornay, 'the streams pursue their course to the sea without affording one-twentieth part of the advantages which might be secured from them.'

"It would be superfluous to enlarge here on the considerations of public interest which are now more strongly than ever connected with the subject of agricultural labour. Those who are anxious for the future prosperity of the country are bound to second the Government in realizing the idea expressed by the Minister of Agriculture and Commerce in his circular of the 3rd March, 1850—'The Government wishes the lot of the agricultural labourer to be so enviable, as to counteract the temptation to exchange it for a town life. *On the other hand, it is desirous that the artizan in town be induced to remove to the midst of the fields, where he will find health and prosperity for himself and his family.*'

"All these motives amply prove that the moment has arrived for carrying into execution the long meditated project of forming a company which shall raise the funds necessary for those great works of irrigation, which do honour to some neighbouring countries, and of which France has been hitherto deprived. It is with this object that this Company has just been definitively constituted."

The Company is entitled "The General Agricultural Irrigation and Drainage Company, with or without the use of liquid manure."

Dec. 1st, 1850.

L'Echo Agricole.

THE IMPORTANCE OF CLEANLINESS FROM WEEDS IN THE SOIL.

The spontaneous growth of weeds is one of the singular practical questions with which the farmer has to deal, and we may say one of his chief difficulties arises from the pertinacity with which some class or classes of weeds dispute the possession of the soil with his cultivated plants. He has to plough, and pulverize, and till, and sow his turnips, his carrots, or his corn—to exercise the most vigilant and watchful care over them even before they are committed to the earth; and sometimes all his efforts to produce a full and productive crop are completely baffled, and he has a failure: but the weeds never fail. The couch, the thistle, the dock, the charlock, and fifty others require neither seeding nor harvest: they require no preparation nor manure, no care; nay, in spite of scores of destructive agencies they will rise above all, and assert their dominion. So remarkably is this the case, that one advocate for a purely electrical theory of cultivation went so far as to assert that the circumstances favourable to the growth of *crops* was positive electricity: those favourable to the growth of *weeds* was negative! And yet, abstractedly considered, there is no difference between a cultivated crop and a crop of weeds. The charlock and the turnip belong to the same natural family—the *Brassica:* the couch and the wheat-plant also belong to the same—the *Triticum:* and yet the one will grow and flourish where the other will fail; nay, the growth and prosperity of the one seems to be the cause of the failure of the other. We are aware that it may very justly be urged that, while one plant is only an acclimatized exotic, the other is an indigenous plant, suited naturally to the soil, the climate, the geological formation of which it takes possession; and the other has, perhaps, to battle against adverse influence, contrary to its instincts. But how does it happen that the utmost care and attention is required to encourage the one to grow, and as much care and attention, if not more, are necessary to prevent the other? So hydra are the characters of some weeds, that decapitation seems only to encourage; and when the cultivator has even flattered himself that his soil was free from them, they will rise up and assert their dominion with as much tenacity as if there were truth in spontaneous generation. But there is no such thing. A dock or a thistle can no more grow without a seed than an oak or an apricot; but indigenous plants have always modes of disseminating seeds so adapted to their localities and the circumstances of the climate, that they spread so insidiously, so unaccountably, that it is scarcely possible to detect their migrations.

Now we believe that the reason why in some circumstances weeds grow more strenuously than crops, and *vice versa,* is, that there are *circumstances of the soil* suitable to each. Thus, in one condition, mechanical and manurial, the soil will produce luxuriant cultivated crops, while in another it will produce a strong crop of weeds; for we often find *that* where a large crop of turnips or clover, or even of corn, occupies the soil. Mr. Spooner, in a recent essay before the Hants Agricultural Society on agricultural experiments, to which we alluded last week, puts these circumstances in a very striking light. After alluding to the importance of cleanliness from weeds in the soil as a cardinal point of good cultivation, and adverting at the hitherto adopted modes of securing it, viz., drilling and hoeing—and he might have added raking and hand-weeding—he goes on to suggest that high manuring has its influence, and that a very considerable one, in this direction. He says: "I believe that, without underrating other adjuncts in the slightest degree, there is no more certain method of securing the cleanliness of land than by the liberal application of such manures as Peruvian guano, which contains a large per centage of ammonia. I have found during the past year, that where I have manured highly, the stubble was the cleanest; and this was remarkably exemplified in the case of the oats (mentioned in last week's *Journal*), which I have quoted, where one wheat crop followed another. This practice has been condemned as bad husbandry, and accordingly forbidden in many leases. It is however, I believe, a mere question of manure. If the second white straw-crop receives a dressing of guano or other manure, all complaints of bad husbandry must, or ought, to fall to the ground. It is a satisfactory fact that, whilst our valuable grasses and grain and pulse crops readily respond to the application of concentrated manures, such is not the case with weeds and coarse grasses. A striking case in point came before the attention of the writer some time since Early in the spring of 1849, a small portion of land was dressed with a compound manure, composed very largely of ammonia and phosphate of lime, at the rate of 3 cwt. per acre, the remainder of the field receiving at the same time a good dressing of dung. The field was infested with the common buttercup, and whilst as the season advanced, the yellow tinge extended as usual over the field, the spot where the concentrated manure was applied was distinguished at a distance by the fact that scarcely a buttercup was to be seen. The herbage consisted of the sweetest short grasses, and proved afterwards very abundant. The spot could again be discovered this year by the absence, to a great extent, of the yellow flowers."

We think nothing is clearer than the fact that wheat will not grow successfully in a newly-broken-up alluvial grass-field; so there are rich conditions of soil which are inimical to the development of weeds; and, other things being equal, there can be no doubt that a soil in a rich condition will be much cleaner than one that is poor and exhausted.—Gardeners' and Farmers' Journal.

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

(From the Morning Chronicle.)

LETTER XV.

NORFOLK, SUFFOLK, AND ESSEX.

I propose in the present letter to enter somewhat more in detail into the condition of the agricultural labourer as regards his work and his wages, and to point out a few of the evils in connection with these subjects which tend to produce that feeling of sullen discontent which is so generally prevalent among them—particularly in those portions of this district where of late so many incendiary fires have taken place.

I shall first deal with the question of wages. In my previous letter I stated that the wages of the labourer averaged from 7s. to 9s. per week. Nothing, however, could be more erroneous than to suppose that the actual amount paid to the labourer is equal to that sum, or, on the other hand, that it is his good fortune to receive such a sum during the entire year. The system of hiring the labourer by the week is one which is comparatively rarely adopted in Suffolk; when, therefore, we are told that the wages of the labourer are 8s. per week, it is, so far as the great body of agricultural labourers are concerned, a perfect delusion. Labourers are paid by the day, not by the week—and only for the number of days during which they are actually at work. If, in consequence of wet or unfavourable weather, they are unable to work, the wages for such days are deducted from what, by courtesy, are called their weekly wages. If a day's sickness or domestic affliction keeps the labourer at home, the same principle is acted upon. In fact, upon the day which was set apart for the General Thanksgiving, the wages of great numbers of the labourers were stopped, on the plea that no work was then done by them. I am happy, however, to state that the instances of such hardship, and of such total disregard to the comforts of the poor, which came under my own notice, were comparatively rare. Those of the farmers who acted in so ungenerous a manner towards the labourers were principally confined to a small district in the western division of the county, to which I shall presently have occasion more particularly to refer.

The full wages of 8s., or even 9s. per week, are little enough to keep body and soul together; but, when from that sum are deducted the wages of every day, or of every portion of a day, upon which the labourer is unable to work, the manner in which he exists becomes a mystery indeed. "There's some weeks," said a poor fellow to me, "that we only get 4s.—sometimes less than that—and in very wet weather we gets nothing at all." "How, then," said I, "do you manage to subsist, and pay 1s. 6d. a-week for that cottage of yours?" "We can't do it on our wages, you may be sure," he said; "the truth is, master, that we're often driven to do a many things those times that we wouldn't do if we could help it. It is very hard for us to starve, and we sometimes pull some turnips, or p'raps potatoes out of some of the fields, unbeknown to the farmers." Is it to be wondered, if the poor man is thus tempted to commit these acts of depredation in order to preserve his miserable existence?

It has been very generally stated to me by the farmers, when I have spoken to them upon the subject, that the labourers are now much better off than they ever were, and they generally put their proposition in these words:—That 8s. a-week wages, with wheat at 42s., is much better than wages at 9s., with wheat at 56s. Taking the two extreme points thus selected by the farmers, there could be no doubt as to the perfect truth of the proposition. But how stands the fact? The minimum of wages is not 8s. (or at the rate, rather, of 8s.) per week. In the great majority of cases, they are not higher than 7s.; and within the last fortnight, and since writing my last letter, there has been an extensive reduction to 6s. per week. Speaking to a labourer, whose wages had been gradually reduced from 1s. 4d. a-day *before*, to 1s. 2d. *after* harvest—and now finally to 1s. per day—I asked him if he did not think that he was better off with low than with high wages, supposing that wheat was at a proportionately high price? He replied—"We can get more bread for the money, and that's some consequence to poor men like we, but they don't lower the rent to us when they lower the wages. When I was getting 9s. a-week I had to pay eighteenpence a-week for rent, and I must pay the same now when I am only getting 6s. a-week; and then I don't know how long I may be able to get 6s. The farmers have nearly got in all their seed, and then we may go about our business. And then if I a'int got no money to buy the bread, why what's the consequence if it's cheap or dear?" Viewed in this light (and many of the labourers are shrewd enough to look at the question in this way), the condition of the labourer must be bad enough. As a general rule there can be no doubt whatever, that when the price of corn is low the condition of the labourer is vastly improved as compared with what it is when the price is high. In order to ascertain, if possible, the relation between the price of wheat and the condition of the labourer, as shown by the amount of pauperism, I have extracted from a number of returns on the subject the average number of persons receiving in-door relief, and the average amount expended in out-door relief, in the county of Suffolk, during each of the three years ending the 29th of September, and also the average price of wheat at each of the same periods. The following is the result of my inquiries:—

	1847.	1848.	1849.
Average number of in-door paupers	3,199	2,932	2,935
Average amount of out-door relief	£2,802	2,315	2,219
Average price of wheat for quarter ending Sept. 29	67s 1d	51s 3d	45s 9d

Mr. French, who is vice-chairman of the board of guardians of the Hartismere union, stated to me that he had paid considerable attention to the subject, and he had come to the conclusion that the labourer was generally much better off when the price of corn was low than when it was high—and, as a consequence, that in all well-managed unions the amount of poor rates and the number of paupers were then considerably reduced. A most intelligent master of a union-workhouse on the borders of Norfolk and Suffolk also made the following statement to me, as the result of considerable experience:—"During the high price of flour I have invariably found more paupers come into the house, and altogether a larger proportion of destitution in the union." He also states that at one time, when corn was high, he had, out of 396 persons in the workhouse, 114 who were able-bodied labourers.

If this be the case, the question arises, how is it that at present, throughout nearly the whole of the county, there is such general and wide-spread distress, and so much of complaint and dissatisfaction among the labourers? This conducts me at once to the second subject with which I propose to deal—viz., the employment of labour by the farmers. I have taken considerable pains to ascertain, in the course of my inquiry, whether there existed generally throughout the county an excess of labourers; whether there were more hands than could be profitably employed by the farmers upon the cultivation of their land; and I have uniformly been told, by persons conversant with the subject, that, so far from there being a redundance of labour, there was not enough to cultivate the land properly. Most unfortunately, however, for the comforts of the labourer, there is a very large proportion of the farmers of Suffolk who have gone on making additions to the size of their farms, without increasing in the same proportion the amount of capital with which to cultivate them. The difficulty and embarrassment in which they are consequently placed, prevent them from employing the number of hands which they would otherwise require on their farms, or from sufficiently remunerating those whom they do employ. I have met with many farmers who sympathize deeply with the depressed condition of the labourer, and who would be willing to give increased employment if it were in their power so to do. The consequence is, that at the present moment there is a considerable number who are out of employ; those who are employed are receiving extraordinarily low wages, and they generally expect that, as soon as the seed wheat shall be all sown, and the weather shall become in the least unfavourable, the opportunity will be taken of discharging many more of them. The favourable state of the weather for the last few weeks has, indeed, enabled the farmers to employ a good number of men in the fields. Had the weather not proved so propitious, the numbers out of employ would have been very largely increased. I have endeavoured to ascertain, from the various unions of the county, the increase in the number of able-bodied paupers, in the hope that it would afford some guide in forming a conclusion as to the number of persons actually unemployed. The returns, however, for various reasons, do not afford the full amount of information on the subject which was to be desired. The average number of able-bodied paupers receiving in-door relief in the county of Suffolk was, for the thirteen weeks ending September 29, 1848, 119; and for the same period of the present year the number was 174. The number of able-bodied paupers actually receiving in-door relief, in the week ending September 29, 1848, was 101; and for the week ending September 29 of the present year, the number was 166.

Of course it will be understood that these numbers only refer to the able-bodied paupers receiving in-door relief. They do not show the extent of pauperism in the county, for no account is taken of the insane, the sick, the infirm, or the children, who may be receiving in-door relief; nor do they apply to the number of able-bodied labourers who may be receiving out-door relief in consequence of the sickness of their families, or other exceptional causes. Although the principle of the poor-law is to give no relief to the able-bodied except in the workhouse, still there are many cases in which the boards of guardians relax a little the stringency of the rules. An instance of this kind came under my notice a short time since. A labourer applied to the board for relief; he was asked of course the usual questions as to the state of health of his family—he had six children. There was an evident desire on the part of the guardians to afford some slight relief, which thay knew would be only of a temporary character, rather than be burdened with the expense of maintaining the whole family for an indefinite period in the workhouse. They accordingly strove hard to make out a "case." The applicant stated that his family were all well, and that he only wanted a little assistance to help him in the meantime, as he hoped to get something to do in the ensuing week. The guardians pressed the poor man still more closely. "Is not your wife poorly?" "No," replied the honest applicant. "Are you quite well yourself?" "Yes, I'm pretty well myself." "Is there none of your children ill?" "No." "Not one?" "No." "None of them got the ringworm, or anything the matter with their heads?" "No" was still the answer of the applicant, evidently not perceiving the design of the board. "Have any of them," at last suggested a member of the board, "had the ringworm lately?" "Why, yes," said the poor man, "a little time ago Billy caught it somewhere." The applicant was ordered to withdraw—the consciences of the board were sufficiently elastic—one of his children had had the ringworm—it was a case of illness—and the man was ordered out-door relief. The following week the man was in work again. Repeated instances of this kind take place among the guardians, and they are generally considered rather liberal towards the poor. The number of able-bodied paupers receiving in-door relief does not, therefore, afford complete information as to the number of labourers who may be unemployed, although by comparing one period with another some idea may be formed as to the amount of employment. There are, however, many labourers who, when unemployed, refuse to apply for relief, as they are aware that, if able-bodied, the workhouse would be the only relief offered them; and sooner than subject themselves to such restraints as would be there imposed upon them, they endeavour by some means, fair or foul, to support themselves until they are enabled to get employment. We have, therefore, no means of ascertaining with accuracy the number of persons who are at present out of employ; but there can be no doubt whatever, from the statements I have heard in various parts of the county, that the number is considerably greater than it has been for some years past, and that the coming winter is expected to be one of great hardship for the poor.

Another of the causes of complaint which I have frequently heard among the labourers, is the hardship of having to walk some ten or dozen miles in the course of the day, in going to and from their work. The necessity for this has arisen from the practice which exists in the neighbourhood of some of the larger towns—upon the part of some of the close parishes, or of the owners of extensive estates—of endeavouring to evade the operation of the law of settlement, by pulling down the cottages, or turning out the tenants just before the expiration of the term which would make them irremovable. Upon several properties in the neighbourhood of Bury, for instance, I have been informed of cases where, upon the slightest possible pretext, a whole family has been driven off the estate. The poor people thus driven away are unable to obtain accommodation in the villages in the immediate neighbourhood, the owners of property there not wishing to run the risk of having any burden thrown upon their parish—and they accordingly seek shelter in some of the wretched back streets and lanes of the larger towns. In several instances I was told by the labourers themselves that they had to walk one, two, three, or four miles to work on the very estate from which, as tenants, they had but a short time since been removed. I was informed of the case of one family which had been driven off an estate situated a few miles from Bury, under circumstances of the greatest hardship—though, it must be added, that there are few gentlemen who have devoted more time and attention to the improvement of the cottages and the condition of their tenantry than the owner of the estate in question. The plea for the removal of this family was, that the mother had been seen to pick up a few small potatoes which had been left upon the surface of the field, after the bulk of the crop had been removed. After having been turned out of the house, the whole family took up their abode within the porch of the church for two days, determined that they would not be driven out of the parish, although they might be evicted from their dwelling. From the church, however, they were finally removed as vagrants, and, travelling on to Bury, they obtained lodgings in the wretched place to which I referred in my former letter, viz., Hogg's-lane.

Several other instances like this came to my knowledge as having occurred in the neighbourhood of Bury. In the various other parts of the county through which I have travelled I have made it my business to inquire into the existence of such a practice; and I feel bound to state that the result of my inquiries was such as to lead me to the opinion that it is not carried on to so great an extent as I was led to suppose, except in some comparatively few cases, where close parishes exist in the immediate neighbourhood of large towns. I found upon inquiry that in a great number of cases where cottages had been pulled down, others had been erected in their stead, of a more commodious character, and in some cases nearer to the farms. Taking the whole county, I do not believe that the number of cottages pulled down has exceeded the number of new ones that have been built. The insufficiency of cottage accommodation remains, however, still as great.

Another complaint on the part of the labourers is founded on the unfeeling manner in which they consider they are almost invariably treated by their employers. They feel, to use their own words, that "they are treated like slaves." It is seldom, they say, that the farmer will condescend to speak to them, except in terms of reproach or abuse. There is no display of anything like kindly feeling towards them, nor any desire shown to improve their condition. But, amidst the general ill-feeling which subsists, it is gratifying to witness in some instances the display of kindlier sentiments between the parties. On the day before that set apart as Thanksgiving Day, I was in company with two farmers who occupied, one upwards of 500, the other about 700 acres. Having heard a rumour among the labourers, of the intention of many of the farmers not to pay the men the wages for that day, I was anxious to ascertain from the farmers themselves if there was any foundation for such a report. I accordingly addressed myself to the one who occupied the larger farm, and asked him if he intended to pay his men their wages if they did not work? "Pay 'em! no—certainly not," said he; "they're not agoin' to work, and why should I pay 'em for adoin' nothing? I've told my foreman not to give 'em anything." Shortly afterwards I addressed myself to the other farmer—an aged, grey-haired man, whose warm and benevolent-looking countenance strongly contrasted with that of the former. His answer to my inquiry was—"Why, to be sure I do; I wouldn't think of stopping the wages of the poor fellows on such a day. Lor' bless me, I'd rather give 'em something extra if I could afford it, than stop anything." Upon further inquiry I learned that the latter was paying his men 1s. 4d. per day—the former had on the Saturday night previously reduced the wages to 1s. per day. It would be idle to ask whose labourers were most likely to be the best contented, and which of the two farmers received the greater amount of labour from the men in return for the wages paid.

Unfortunately it is the fact, be the cause what it may, that there does exist throughout the county—but to a considerably greater extent where low wages are paid—a very large amount of ill-feeling on the part of the labourers; and considering, as they most unhappily do, that they are ill-used and underpaid, it cannot be a matter of great surprise if among them there should be found numerous instances in which they have blindly and wantonly endeavoured to wreak their bad feelings upon those whom they consider to be the causes of their grievances.

Within the last two months the crime of incendiarism has been fearfully on the increase in some portions of the western division of Suffolk, and in those portions of the counties of Essex and Cambridgeshire which lie contiguous to it. Incendiary fires are not, unfortunately, of rare occurrence in Suffolk. There have been times during which the people have, as is almost the case at present, been nightly alarmed by the sight of blazing ricks and farms in various parts. I find, upon inquiry, that during each of those periods the wages, as compared with the price of wheat, were remarkably low. The years 1816 and 1817 were the first in which incendiarism prevailed to any extent. The price of wheat in 1816 was 85s. 9d.; in 1817, 89s. 1d. The wages in the former year were 10s.—in the latter 11s. per week. In 1825 incendiary fires again became numerous: the price of wheat was 68s. 7d., the wages 8s. 6d. In 1843 and 1844 the evil again broke out: wheat in 1843 was 54s. per quarter, wages 8s.; in 1844 the price of wheat was 51s. 3d., and wages in some parts were as low as 7s. per week. In the years 1843-4 there were not less than 89 incendiary fires in the county of Suffolk, the vast majority of which were in those portions of the county where the wages were the lowest. The average price of wheat for the quarter ending 29th September, 1849, was 45s. 9d.; the rate of wages in those portions of the county where the fires have recently occurred being 7s., but now reduced to 6s. per week. It is not my intention to enter into any inquiry as to what may or may not be considered a fair rate of wages to be paid to the agricultural labourer. Any person who may be disposed to enter into the inquiry as to the proportion which the wages bear to the price of corn may easily do so by ascertaining the quantity of corn which the wages would purchase at the different periods. Adopting, for a moment, the standard advocated by the farmers, of 8s. per week when corn is at 42s., the quantity of corn which could be purchased by wages of 8s. per week would be about 6 pecks; but with the present wages, in some parts, of only 6s. per week, but little more than 5 pecks could be obtained. The reader may easily calculate for himself the value of the wages, upon the standard of the farmers themselves, for the different years in which fires have been of the most frequent occurrence.

Since August last there have been no fewer than seventeen incendiary fires in a portion of the county of about fifteen or twenty miles in length from north to south, and about twelve or fifteen in breadth. This district forms the southern part of the western division of the county, adjoining the district about Soham in Cambridgeshire on the west, and the district of Saffron Walden in Essex on the south. In these portions of Essex and Cambridgeshire the fires have been almost as numerous as in the county of Suffolk, and no doubt they have their origin in the same cause. The value of property thus destroyed has been, I am informed, not less than £14,000. Indeed, to such an extent has the system prevailed, that certain districts of Suffolk, Cambridge, and Essex have been placed under "ban" by the fire offices, several of them having refused to insure farm property there.

I have endeavoured as far as possible to ascertain the causes of these incendiary fires, and I have been unable to arrive at any other conclusion than that they originate in the distress and discontent of the labouring classes. Individual cases have occurred in which the fires, to all outward appearance, are not traceable to this source. Several fires have happened in cases where a comparatively high rate of wages was paid, where the labourers were generally contented, and where every possible exertion was made on the part of the employer to furnish them with work and to improve their condition. A gentleman who occupies a prominent position in one of the parishes where several fires have occurred, informed me that in 1844 he had paid considerable attention to the subject, that he had been present at many of the fires, and that the conclusion which he then came to was, that they were almost universally attributable to the low rate of wages; and that he had no doubt whatever but that the same cause applied to the fires of the present year. Indeed, the prevailing opinion among all thinking persons appears to be that they are owing to the very general depression and discontent of the people in those parts where the fires occur.

It does not appear that there are anything like secret societies among the peasantry, where the fires are planned or concocted. There is, however, a very general opinion among the police and others, that there is scarcely a fire which occurs the perpetrator of which is not pretty generally known in the neighbouring village. At Dalham, Gazeley, and several other small villages in the Risbridge union, there is evidently a great desire on the part of the people to screen the offenders. The people of Dalham uniformly refuse, I was informed, to render any assistance in putting out the fires, and upon one occasion they actually cut the hose of the engine, and fired upon the firemen who were working it.

Many persons are of opinion that the fires are, in the majority of cases, the work of one man only; and they support their opinion by the following fact. A short time since a man was transported from Dalham for the crime of poaching. His son, who resided in the parish, and carried on the trade of a basketmaker, was frequently heard to state that he would be the ruin of the parish. Numerous fires took place shortly afterwards, and there is no doubt that many of them were the work of this individual. The plan which he used to adopt upon such occasions was to place a small bundle of shavings, sticks, and other matters, well besmeared with pitch and other combustible materials, made up in such a manner as that ignition should not take place until he was enabled to get to some distance from the spot. In several cases these bundles had been discovered unignited; and upon examining them they were found to contain chips of osier—which circumstance, he being a basketmaker, naturally led to the inference that the bundles had been placed there by him. On one occasion, a portion of a hankerchief with some of these chips, which was traced to his possession, was found upon the premises after a fire; but, although the man has been tried upon several occasions, the authorities have not been able to procure a conviction. The man has now left the district, and the fires have been somewhat less in that immediate neighbourhood. The labourers themselves who are employed, even at miserable wages, are almost by common consent acquitted of being wilful parties to these acts of incendiarism.

The prevailing opinion on the subject appears to be, that the fires are not generally referrible to one common origin, but that, in a great majority of cases, they are traceable to a spirit of wicked and wanton mischief on the part of boys—and perhaps even of vagrants—excited and brought into action by a spirit of imitation; and that, the fires having once broken out, a ready means of gratifying revenge is placed before their view, while the cheapness and ease with which lucifer matches may be procured offer facilities for giving effect to the feelings of hatred or hostility excited towards particular individuals.

There appears to be no reason whatever for supposing that the administration of the poor-law has anything to do with producing these fires. Indeed in several of the unions in which fires have occurred, the law has been carried out by the guardians with a total absense of anything like harshness or cruelty, and the provisions of the law are even frequently strained with the benevolent view of affording the fullest possible relief. Generally speaking, there is not, in these districts, so strong a feeling of dislike to the poor-law among the labourers as may be found in some of the unions where no cases of incendiarism have occurred.

I have heard an opinion expressed that a great number of incendiary fires were traceable to boys. After the age of sixteen the boys become paupers in their own right. The parents begin to think that it is time that the boys should earn something for themselves; the boys also think that they ought to assume the habits of men, and they wish to become independent of their parents; they accordingly endeavour to get work, but they are boys in the eye of the farmer, and they have not the requisite qualification for high wages: they are unmarried; they are not able to earn more than from 2s. 6d. to 3s. 6d. a-week. They soon get tired of working for so small a sum; they spend a short time in the workhouse; becoming dissatisfied there, they meet with other boys of the same age who are similarly situated; they talk over their grievances, and become sullen and discontented with everybody and everything; they leave the house literally with their hands against every man, and avail themselves of the first opportunity of indulging their feelings upon the property of those who may or may not have done them some real or imaginary wrong.

There are many fires which are considered as the work of the incendiary, but which might perhaps be ascribed to other causes, such as accident or negligence. A few days since a large fire occurred a few miles from Bury, which for some time was considered to be the act of an incendiary; but it came out some time afterwards that two little boys had been playing with some lucifers in the neighbourhood of the farm, and by accident had set fire to one of the stacks.

Referring to individual cases of incendiarism, it is curious to observe how, in the great majority of cases, the fires occur in districts where either a low rate of wages is paid, or where the labourers deem themselves improperly treated. Speaking to many of the labourers upon the subject, they have not unfrequently made use of expressions towards those whose property had been destroyed, such as—"Oh, sarve him right;" "He was a grinder;" "He was a strict, hard-fisted fellow;" "He was very hard upon his men," and other terms of a similar character. On the other hand, some of the fires have happened in cases where the farmers bore the highest possible character. In one case a farmer of about 500 acres received the prize at the Stow Agricultural Society for employing the largest amount of labour in proportion to his occupation. Another farmer possessed the general reputation of farming higher, and employing more hands, than other persons in the district. A short time since an extensive fire occurred near Kirtlinge, which destroyed the whole of the property. A portion of the premises had been burned down last year; they had but just been rebuilt, and the workmen had not left more than a few days, when a fire again broke out, and burned the whole of the newly erected premises, together with that portion of the old which escaped upon the previous occasion. The farmer bore an excellent character. Two fires recently occurred in Fornham, in both of which cases the farmers bore a high character, and were in the habit of paying a better rate of wages than most of the farmers in the neighbourhood.

But while, on the one hand, some farmers who bear a good character among the labourers have suffered, there are many instances in which they have been spared, although fires have been constantly taking place around them. A large farmer, residing five or six miles from Bury, and farming upwards of 1,000 acres, was a singular instance of this. "He is a good man—a good fellow," said a labourer to whom I was speaking; "he is one of the best men we have round here, and he hasn't had so much as a hay-rick, or barley-stack, set on fire. Aye! a better man never trod shoe leather than he. The poor men all like him; he isn't ashamed to speak to 'em when he sees 'em, and he's always glad to help a poor fellow when he's in want." Neither in 1843 nor in 1844, when so many fires occurred, was there a single fire upon his farm—nor have there been any during the present outbreak. Upon many of the estates that are well managed, and where there is a resident proprietor, comparatively few cases of incendiarism have occurred. On the estate of a gentleman near Lavenham, it was found necessary to remove one of the tenants, in consequence of some bad conduct upon his part, and on the following day a barn upon the estate was fired—there being no moral doubt that the evicted tenant was the guilty party. The case could not, however, be brought sufficiently home to him to procure a conviction. No other instance of incendiarism has occurred upon the estate, although it is situated in the very heart of the district in which so many fires have taken place.

But although there are cases in which the farmers who bear a high character have suffered, and likewise cases in which they have escaped, there are also many in which farmers who are very generally disliked by the labourers, who give very low wages and afford but insufficient employment, have escaped injury. You may frequently hear the poor people speak in terms of unmeasured abuse of some of the farmers; and, in looking over the list of fires, you expect to find some of their farms included. Such, however, in a great many instances, is not the case. Any theory which may be set up on the subject is, therefore, liable to be immediately overthrown by some case or cases which may be cited, and which it is impossible to reconcile with any preconceived opinions. Difficult as it may be to explain many individual cases, we have, however, the broad facts before us, that in the northern and eastern parts of the county fires are comparatively unknown, and that the rate of wages is higher there than in the other portions of the county; and that in the southern and western parts of the county, where fires are constantly taking place, the rate of wages is, generally speaking, lower. In the former case, wages average from 8s. to 9s. per week; in the latter, from 6s. to 7s. per week. How far low wages may tend to produce this state of things is a question upon which the reader will form his own opinion.

Before leaving the labourers of Suffolk, I will shortly refer to the state of education among them. Upon this question blue books are silent, and any attempt to arrive at a conclusion would be certain to result in failure. One mode that is generally adopted of arriving at information upon this point is by taking the number of persons who in any particular district may have signed the marriage register with their mark, not being able to write their names. Adopting this standard, it appears that the number of men so signing the register in the county of Suffolk, in the year 1847, was not less than 1,083—being 42 per cent. above the average of all England and Wales upon the like number of marriages. There is no doubt that this is an enormous per centage, and it must also be remembered that this applies to the whole county, including persons of every class and condition who were married during that year. It is but fair to suppose that among persons in better condition than the agricultural labourers, there would be but few probably who would be unable to write their names. Among the tradesmen there would be also a far greater proportion to be found, able to write their names, than among the labourers. How many of the agricultural labourers of Suffolk were able to sign their names would be a curious point upon which to obtain information, and one which would be necessary if we wished to arrive at the state of education among that numerous body. Unfortunately the information is not forthcoming; but we are fully justified in assuming that among the labourers, as a body, there is to be found a far greater per-centage of persons who cannot write their names than would appear from taking the average of the whole county. Of course the evidence adduced by the marriage registers applies only to the state of education among the adults—the people of the last generation. What is the case as regards the rising generation? Here, again, we are left to grope our way almost entirely in the dark. We search in vain through the enormous pile of blue books for information upon this all-important subject. We have accurate accounts of crime and pauperism, exports and imports—nay, even of the number of herrings cured, dried, salted, and otherwise disposed of; but, with the exception of the case of pauper children, we have no educational statistics upon which we can rely. After some considerable trouble I have been enabled, however, to obtain "The Result of the General Inquiry made by the National Society into the state and progress of the schools for the education of the poor in the principles of the Established Church, during the years 1846-7, throughout England and Wales." This Return does not include schools connected with dissenters, nor Church of England preparatory schools, nor grammar schools. The preface to this voluminous document states that, although every care had been taken to insure accuracy in the details, still there was no doubt that many inaccuracies were to be found. From these returns I have collected that there are in Suffolk 699 schools, having 32,667 scholars under their charge—being a proportion of 1 in 9 to the entire population of the county. By the minutes of Council on Education for the last year, I find that the number of pauper children receiving education in the schools connected with the workhouses is 1,043. The number of scholars in connexion with the Wesleyans is, I believe, about 4,000. As to the numbers in the schools connected with other bodies of dissenters, I have no means of obtaining information. Probably there may be about the same number as in connection with the Wesleyans. The number of children in connection with the Roman Catholics is, I believe, very small—probably not exceeding 100. I have no means of ascertaining the numbers attending the various private schools throughout the county. The total number of children in connection with the schools of the National Society throughout England and Wales is computed at 1 in 11½ of the entire population; in the county of Suffolk the proportion appears to be 1 in 9. It would appear from this, that the state of education among the children is rather in advance as compared with the whole of England and Wales. The education of the children of the agricultural labourers is, however, remarkably deficient; and in this respect the pauper children are placed in a much more favourable position. There is a school in connection with each of the workhouses, where the children are taught the rudiments of education, and in several of the schools which I visited considerable proficiency was exhibited in some branches of instruction. At the pauper school at Stowmarket many of the boys write excellently, and are good bookkeepers. At the Blything Union, many of the children have made considerable progress in the art of navigation, and have obtained employment in the navy; and some of them have obtained marks of merit for their good conduct. As an instance of the want of education among the pauper children in some parts of the county, and of the benefits likely to result from the establishment of pauper schools, I may mention the case of a school which I visited at Wortham, in connexion with the Hartismere Union. During the examination of the children, a number of questions were asked and answers given—among others the following:—

"Why was Lazarus seen afar off in Abraham's bosom?"

"Because he was Abraham's father."

"What is a publican?"

"A Pharisee."

"What was Matthew?"

"A fisherman."

"What did the Jews expect the Messiah to be?"

"A false prophet."

"What is faith?"

"The substance of anything seen."

"How many Houses of Parliament are there?"

"Three—two."

"What is the upper one called?"

"The house of dukes."

"What is the lower one called?"

"The house of gentlemen."

"Who puts on the taxes?"

"The Queen."

"Suppose you were to send a person to the House of Common, who would he represent?"

"Gentlemen."

"If you were to send one, who would you send?"

"You, sir" (to the chaplain).

"What would you send me there for?"

"To collect money."

It must, however, in justice be stated, that, considering the short time during which they had been receiving instruction, they had made considerable progress in many other branches; many of the boys and girls read well, and some of the girls wrote an exceedingly good hand. The late master of the workhouse, I was informed, had been in the almost constant habit of neglecting his duties, and the guardians were finally compelled to remove him. During the short period in which the present able master, Mr. Dunlop, has been engaged, a marked improvement has taken place in the children.

It is pleasing to notice the great exertions which are in many cases made on the part of landed proprietors to afford the means of education to the children of their tenants. There is scarcely a large estate upon which one or more schools have not been erected—the salaries of the masters, and other expenses attending them, being defrayed by the proprietors themselves. Among schools of this class may be mentioned those of Mr. Shaw, of Kersgrave Hall, near Woodbridge; of Sir Edward Kerrison, of Stradbroke; of Mr. Benyan, of Culford; and Mr. Kerrison, of Broome Hall, who has also established an industrial school in connection with one in which the usual routine of education is taught. Great credit is also due to the great body of the clergy throughout the county, for the manner in which they have exerted themselves to provide the means of education for the children of the poor. In many of the parishes are to be found small schools, which are supported entirely from funds derived from the miserable stipends of the country curates. There is still, however, a great want of school accommodation throughout the entire county. There are four parishes in the immediate neighbourhood of Ship-meadows, a district lying between Bungay and Beccles, in which there is not a single school, with the exception of a small Sunday-school, conducted entirely by the wife of one of the curates—the parties residing in the parishes not being able to raise a sufficient sum either to establish the schools or to allow them to obtain any assistance from the Government grants. There are other parishes in which, unfortunately, there is no school accommodation whatever; and in many the schools are of the most wretched character.

THICK AND THIN SEEDING.

The proper quantity of seed, for the various grains, to be sown to the acre, is a subject on which much has been said and written, especially in England, where many experiments in relation to it have been made. The question cannot be fully settled, without a long series of carefully conducted experiments; made and *repeated* under the same circumstances.

The *Transactions* of the N. Y. State Ag. Society for 1849, contain the results of some trials by Mr. Adam Clark, of West Dresden, Yates county, in sowing various quantities of wheat to the acre. The communication of Mr. C. was referred to a committee, of which John Delafield, Esq., was chairman, who submitted a report from which we take the following:—

The experiments of Mr. Clark show that wheat planted uniformly at distances of 1½ inches apart, will require about 224 ¼lbs., or 3 bushels 44¼ lbs. per acre. This weight of wheat consists of about 2,890,320 grains. Mr. Clark planted a portion of ground in this manner, which was harvested at the proper season and thrashed on the 22nd of August, and weighed on the 17th December. Estimating every ounce to contain 800 grains, as weighed by him, the product of an acre similarly treated produces 63,248,000 grains, or 4,160 lbs., which is equal to 69 bushels 10 lbs. of wheat per acre.

The second experiment shows that about *two bushels* of wheat, or 126 lbs., sowed on an acre of ground at the uniform distance of *two* inches apart, will yield 3,580 lbs. of wheat, or 59 bushels 40 lbs. per acre. In this experiment the number of grains sowed to an acre is about 1,616,000.

It has been usually estimated that in broad-cast sowing of wheat under, favourable circumstances as to weather and condition of the soil, the average deposit of seed is 48 grains per square foot: if so, an acre of broad-cast requires 2,090,880 grains; and estimating this quantity at the weight of Mr. Clark's wheat, it gives two bushels 44 lbs. per acre. It would have been advisable to measure and weigh the seed *before* planting, as well as after harvest, as season and cultivation may essentially vary the relative quantity and quality of the seed and the product. We would have been pleased to know, also, whether every seed planted arrived at maturity; if not, what proportion was imperfect or destroyed. It is well known that a large per centage of the wheat sown broad-cast is lost to the farmer. We need therefore very exact observation, to approximate a fair estimate of comparisons.

The following is the substance of Mr. Clark's statement:—

On the 23rd Sept., 1848, I prepared four beds of ground to plant with wheat, on a summer fallow that had been twice ploughed during the summer. The ground was prepared by finely pulverising it with a hoe and rake, to the depth of eight inches. Four beds were accurately measured, each one-fourth of a rod square, leaving a walk of about 7 inches between them; they were numbered and subdivided as follows:—No. 1, in squares 1½ inches each way; No. 2, about 2 inches; No. 3, a little short of 3 inches; No. 4, 3½ inches, including the outside lines of each bed. Then with the thumb and finger I carefully dropped a kernel of wheat in the corner of each small square of Nos. 1 and 2; then, with a stick prepared for the purpose, I placed each grain 1½ inches below the surface, and then with the head of a rake made the surface entirely smooth. On Monday, 25th, I planted Nos. 3 and 4 in the same manner; they were all planted with the Soule's variety of wheat—the seed dry, without any preparation. The soil is a clay loam, with a slight inclination to the north and north-west, and fully exposed to the winds from those directions. I used no fertilizers, except a little gypsum; on the 17th of May, while sowing on the rest of the field, I gave the bed a slight coating at the rate of from 1½ to 2 bushels per acre. Harvested July 25th, 1849, with a hand cradle, and bound it in sheaves and carried it into the barn in about two weeks. The parcels carefully shelled and kept separate. On the 22nd of August, each parcel was weighed separately by sealed scales, the result of which may be found in the annexed table. On the 17th of December, 3 oz. were weighed in sealed scales, and, by counting all the grains weighed, I found that there were 800 grains in an ounce. An estimate of the amount of seed planted is made from this data, as well as the average product from each.

No. 1.—Number of grains planted 4,488; weight of product in pounds and ounces, 6 lbs. 8 oz.; amount of seed sown per acre, 3 bush. 45 lbs.; yield per acre in bushels, 69 bush. 20 lbs.

No. 2.—Number of grains planted, 2,525; weight of product in pounds and ounces, 5 lbs. 9½ oz.; amount of seed sown per acre, 2 bush. 6 lbs.; yield per acre in bushels, 59 bush. 40 lbs.

No. 3.—Number of grains planted, 1,206; weight of product in pounds and ounces, 4 lbs. 12 oz., amount of seed sown per acre, 1 bush.; yield per acre in bushels, 50 bush. 40 lbs.

No. 4.—Number of grains planted, 870; weight of products in pounds and ounces, 4 lbs. 4 oz.; amount of seed sown per acre, 43½ lbs.; yield per acre in bushels, 45 bush. 20 lbs.—American Cultivator.

AGRICULTURAL EXPERIMENTS.—ARTIFICIAL MANURES.

It is often a puzzling question to account for the unsatisfactory nature of agricultural experiments. Two well-chosen experiments often exhibit results exactly the opposite of each other, when every possible care appears to be exercised, and the experimentor is puzzled what to attribute his failure to—whether to the season, or the soil; and often results in the laboratory are neither justified nor sustained by the field experiments. Now we believe this is neither owing to the fact of vital chemistry having to be considered in these trials—though of course that alone will account for modifications of mere inorganic laws to a very material extent—nor is it so much to the modification of matter, owing to the special action of the soil or atmosphere, as such; but it generally happens that experiments of the same kind present unaccountable anomalies simply because the circumstances of the trials have not been duly considered, and because the *previous knowledge has been deficient.*

Artificial manures are too often considered as stimulants. An attempt was made some two years ago, in a very clever and ingenious paper, in a certain Farmers' Club, to show that guano was not a proper manure, and that it was of a stimulative rather than a nutritive character to the soil—a position which we at the time felt it our duty to oppose; and the recent experiment of Mr. Miles, and his deductions from them, tend to the same theory. The experiment consisted of trials of guano, farm-yard manure, a London manure called copros, and Flemish manure, on the growth of swedes, and was detailed by him at the recent meeting of the Bristol Agricultural Society. The result was as follows, per acre, in tons :—

	Tons.	Cwts.
Farm-yard manure, 13 tons....	20 ..	15
Guano, 3 cwts................	18 ..	17
London copros, 3 cwts.	13 ..	9
Flemish manure, 3 cwts.......	13 ..	1

In another trial he reduced the quantity of the artificial manures, and the result was as below :—

	Tons.	Cwts.
Farm-yard manure, 13 tons....	20 ..	15
Guano, 2 cwts................	14 ..	4½
London copros, 2 cwts.	7 ..	14
Flemish manure, 2 cwts.	10 ..	0

The two deductions Mr. Miles drew from these experiments were these—1st, That there was a *certain quantity* of manure necessary, without which they could not insure a good crop ; and, 2nd, That it was improper to be stingy in the application of manure; for by false economy in the second experiment, the saving of 1 cwt. of guano, which would cost 9s., would lose him 4 tons 12½ cwt. of swedes.

To the last proposition we give our most hearty concurrence. If land be worth cultivation at all, it is worth manuring well; but as regards his first proposition, we are disposed to give a most decided negative. He says he "had tried experiments until he was nearly tired" ; and well he might be if he had arrived at an hypothesis from such a bare array of facts. Now, the conclusion we should have drawn from these experiments is, not that the bulk of manure was necessary, but that the *soil* was deficient in some element which the three artificial manures did not supply, and hence that it was necessary to furnish that to the crop.

Now, we all know that carbonaceous manure is highly necessary to a full turnip crop. In soils abundant in vegetable matter, no other manure than bones — raw or dissolved — coprolites, or guano, would be necessary; but if the soil were destitute or even deficient of carbon, as Mr. Miles' soil had doubtless been, there is no doubt but an inferior crop must result from such deficiency.

The recent essay for the Hants Farmers' Club, by Mr. Spooner, sets a similar matter in, we think, its true light. He applied a dressing of ammoniacal liquor, to land intended for turnips, in the autumn of 1848. In June the field was drilled with Skirving's swede, and the whole dressed with superphosphate of lime, part of the field having been left undressed with the ammoniacal liquor. The result was, that the land dressed with the superphosphate alone yielded 22 tons of turnips per acre, while the ammoniacal-dressed land yielded 27 tons per acre. Now here was a remarkable fact: ammonia is generally supposed to be a manure in itself not remarkaby suitable for turnips, and yet it increased the crop in this instance as much as 5 tons per acre over the dressing with superphosphate, in itself known to be an admissible manure for turnips. And why? Because the soil had been doubtless abundant in carbonaceous matter, and it only required phosphorus and ammonia, with possibly some sulphur, to give a large and productive crop.

Now, Mr. Miles' manure in its bulk supplied the necessary carbon for the plants, and hence it showed a large return of the crop for that application; and, hence, as we observed, the previous merits of the soil must be taken into consideration before the definite result of any experiment can be arrived at. Mr. Spooner thus justly speaks of the difference between nutrition and stimulation, which sets the matter in its true light, and is a complete answer to Mr. Miles :—

"One of the erroneous notions that has greatly tended to retard the more general employment of concentrated manures has been the idea that such manures merely acted as stimulants, and that their beneficial effects were procured at the expense of the staple of the land. Both Peruvian guano and superphosphate of lime have sometimes been so regarded: never was there a greater mistake.

"These fertilisers contain the essential food required by the plant; they each consist of various constituents, and are no more to be regarded as mere stimulants than roast beef and plum pudding are to be considered as such with reference to man himself. The only instance when manure may be justly considered a stimulant is when one essential ingredient is supplied in excess and others are denied : the effect being that the plant is forced to extract from the soil those other elements which the manure should have supplied, and is thus rendered so much the poorer. For example : if a farmer were to manure his crops entirely with soot, or with nitrate of soda, he would supply for the most part one valuable ingredient only, that is nitrogen; in the latter instance in the form of nitric acid, and in the former in that of ammonia; and the result would be, either that the land would become deprived of other essential ingredients, or that the crop, forced on by the stimulating effect of one ingredient, would not arrive at maturity, in consequence of the absence of other essentials (principally the phosphates). If, however, these are supplied to the crop that has already received a dressing of farm-yard dung, then their application, in moderation, is no longer baneful but highly beneficial:

they serve to enrich the manure in its most valuable constituents.

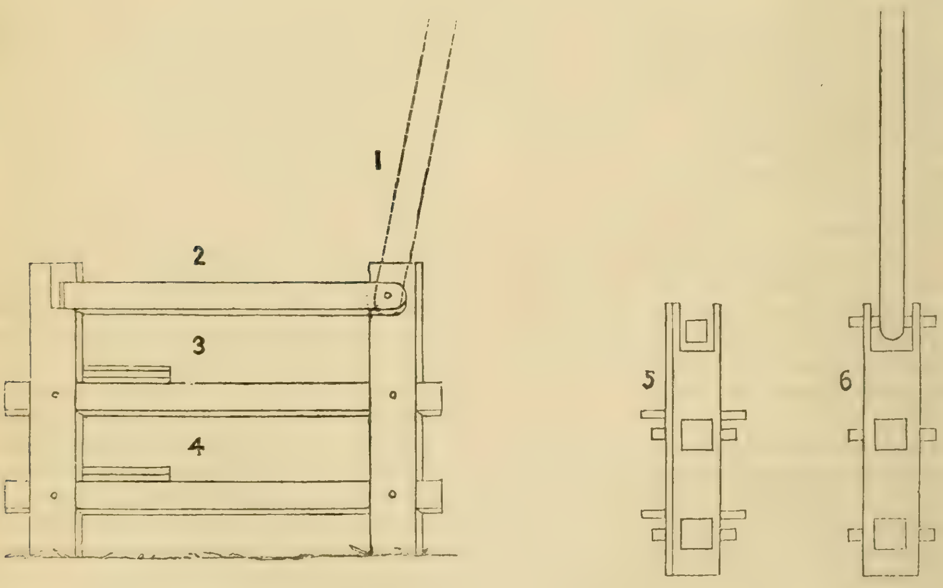
"A manure may also act as a stimulant when it supplies in excess an ingredient which is not required to that extent by the plant to which it is applied; but in this case the injury is not experienced by the soil, but by the plant. It was to ascertain and illustrate this point that the experiments to be referred to were instituted; but previous to our mentioning them it might be well to observe that practical agriculture, assisted by modern science, has established the fact that the beneficial effects of manures are mainly owing to two elements, nitrogen and phosphoric acid; the latter inorganic or earthy, in the form of phosphate of lime, and the former organic, in that of ammonia. At first sight it seems strange that such should be the case, since chemical analysis informs us that vegetable bodies contain several other organic and many other inorganic elements; but an explanation is to be found in the fact that the other organic materials can be procured from the atmosphere, and the earthy ones from the soil."

Food cannot be stimulating; but a plant may be fed with one kind of food until it perishes for want of the other necessaries of life; and this, we think, is the foundation of Mr. Miles' mistake. — Gardeners' and Farmers' Journal.

AN IMPROVED STILE.

A correspondent, writing from Worcester, sends us a drawing, of which the following is a copy:—

No. 1. Position of the rail when raised.
2. Ditto „ „ closed.
Steps, Nos. 3 and 4, with rails.
No. 5. Position of the ends of stile with steps and and rail closed.
6. Ditto „ „ „ raised.



—Hereford Times.

ROYAL FLAX IMPROVEMENT SOCIETY OF IRELAND.

REPORT OF THE SUB-COMMITTEE APPOINTED TO INVESTIGATE SCHENCK'S PATENT SYSTEM OF STEEPING FLAX.

TO THE COMMITTEE OF THE ROYAL SOCIETY FOR THE PROMOTION AND IMPROVEMENT OF THE GROWTH OF FLAX IN IRELAND.

Your sub-committee, on the 31st July last, made a report on the results of their investigations up to that period. They do not consider it necessary, in this their final report, to copy that document at length, but will simply embody the information it contained in the more extended matter which they are now able to lay before you.

Though the committee, from their many opportunities of inquiring into as to the efficacy and advantage of the late Mr. Schenck's process, since that gentleman first brought it before the notice of the society, in 1847, were quite satisfied about it, they suspended their opinion until facts were brought forward on every point; and your sub-committee, in handing in the present report on the objections raised by some parties, will be able to convince you that they do not state a rashly-formed opinion of their own, but rather a publication of the results of experiments conducted by disinterested and competent parties.

As much of the advantage of flax culture depends on being able to economise, to the greatest extent, the crop after being grown, and to reduce the grower's trouble and hazard, whilst insuring the greatest value, your sub-committee hope that their report will prove Schenck's system to realize these desirable points, and will show that, if proper care be given to the process, something as near certainty will be attained as could be expected, and a much more steady return than by the old, slovenly, and uncertain process of watering, conducted by persons often ignorant of the commonest chemical principles, and generally attended with the loss of the seed—a most valuable part of the crop,

The doubts raised as to Schenck's process were —1st, that the yield of fibre would be less than by the ordinary mode of steeping; 2nd, that flax so prepared would be weakened; and 3rd, that the linen made from it would not bleach properly.

As respects the first objection, your sub-committee are of opinion that, either by the common process or by Schenck's, the yield of fibre will be lessened if the fermentation is allowed to go too far. The uniformity of temperature ensured by the latter would induce the belief that the yield of fibre should be increased. This is borne out by two experiments. In the one conducted at Lisburn, by Mr. Davison, in 1847, 112 lbs. of flax straw, after steeping and drying in the ordinary way, gave 20 lbs. of scutched fibre: and 112 lbs., steeped by Schenck's process and dried, gave 24 lbs. In another, tried this year, at Drimoleague, County Cork, from 112 lbs. of straw, the old process gave 14 lbs. 5 oz., and Schenck's, 17 lbs. 11¼ oz. The increased yield in the first experiment was 20 per cent., and in the latter 23½ per cent., in favour of Schenck's method. As respect the quality of the fibre, the result was equally in favour of the latter system. In the first experiment, the flax steeped in the ordinary way spun to 96 lea yarn, and that by Schenck's system to 101 lea. In the second, the ordinary gave 60 lea, and Schenck's 70. A further experiment was communicated by Messrs. Marshall and Co., of Leeds, some flax straw grown in Holland being the material employed. What was steeped in Holland, in the usual way, gave 61 lbs. 1 oz., hackled; and two lots of the same straw, steeped by Schenck's system, in two different concerns, gave respectively 62 lbs. 4 oz. and 64 lbs. per cwt.; the value of the fibre per acre being, of the common steeped £9 8s., and of the patent steeped, averaging £10 12s.

With respect to the second objection, that the flax might be weakened, the same remark may be made, that fermentation, conducted on a systematic and scientific plan, was not likely to weaken the fibre more than the same amount by an uncertain process. And although the fibre might often be made *stronger* by the old plan, when the steeping was not carried far enough, yet, on the other hand, it was frequently over-steeped, and consequently *weakened.* In addition to the favourable report of spinners who had produced yarn from Schenck's flax, of fair strength, the following results of experiments were laid before them:—Several samples of fibre, of full strength, steeped on the patent system, in different places; samples of threads from Messrs. Marshall and Co., of Leeds, unbleached, bleached, and dyed, made from the patent steeped flax to which reference has been made, all being of good, strong quality; a sample of 140's weft-yarn, from Messrs. S. K. Mulholland and Hinds, and a sample of boiled yarn, for heavy linens, from Messrs. Dunbar, M'Master, and Co., of

Gilford. All these were considered of fair, average strength. It is evident to your committee that flax steeped by the patent process can be made either strong or weak, it being in the power of the operator, by increasing or decreasing the time of steeping, or by raising or lowering the temperature of the water, to make whatever quality suited the market, or would best remunerate him. They submit, that *strength* is not what will be most profitable to the grower, but that *fineness of quality, with softness,* will often remunerate him much better, and his interest will be to produce what is most in demand and highest priced. At this point the duty of the society ends; whatever will best remunerate the *grower* being what it is their duty to point out, and it is for the *spinner* to choose strong or weak, as he may require it for different customers.

As to the third objection, that the patent steeped flax might not bleach well, the samples of yarn, thread, lawn, and linen, produced at the present meeting, are sufficient evidence of its groundlessness. The following letter from an eminent bleaching firm is still further satisfactory:—

"*Lisburn, 28th August*, 1850.

"MESSRS. S. K. MULHOLLAND AND HINDS.

"DEAR SIRS,—We have the pleasure to return, finished, the two pieces of linen made from flax steeped on Schenck's plan, which you sent us to bleach; and, during the process, we found the advantage more decided than with the lighter fabrics you sent us, some time ago. These, with other opportunities of judging, have caused us to conclude that the general introduction of Schenck's patent process would be a step in the right direction, unless objections can be substantiated unconnected with the bleaching department of the linen trade.—Yours, very truly,

"RICHARDSON AND CO."

Thus your sub-committee believe that all rational objections have been satisfactorily met. The general question having now been put in a favourable position, it rests with others to pursue the details more minutely; and it is hoped that they will be careful to note and make known both improvements and sources of failure, if any arise, so that the public may benefit by the results of their experience.

Having thus disposed of the subject confined to their care, your sub-committee feel called upon to take some notice of another project for preparing flax fibre, inasmuch as its promoters allege it to be superior to Schenck's steeping system. They allude to Mr. Donlan's plan of separating the fibre without steeping. They are so fully aware that the Royal Flax Improvement Society have no other object than the rendering flax culture of the greatest possible advantage, that, while they discharge their duty, on the one hand, of pointing put the successful result of experiments made with a view of testing the merits of Schenck's system, on the other, they feel called upon to lay before you what they conceive to be radical defects in Donlan's proposed plan.

It is sufficiently obvious that so simple a mode of obtaining flax fibre as its mechanical separation from the stems of the plant, must have been the earliest method adopted when this substance was first used for textile purposes. It is probable that accident first made known the fact, that, by immersing the flax stems in water, when above a certain temperature, the fibre could be divested of impurities by the decomposition of the foreign matters, which, with the woody matter of the stem, are united to it. Up to the present day, no other means of obtaining a pure fibre have been devised. Weak acids, solutions of caustic potash and soda, soap ley, and lime, have all been tried, but have all been found objectionable. The attempts which are on record of different revivals of the dry process fully prove that there is nothing new in Mr. Donlan's proposal. It is known that patents have been taken out at different periods for a similar process, but they content themselves with a reference to some of the best known cases. In 1815, the Irish Linen Board adopted the dry preparation, then brought forward by Mr. Lee, and the records of that Board show that its principle was almost identical with that now proposed by Mr. Donlan. The most sanguine expectations were entertained of it. The very arguments now used in favour of Donlan's mode were then stated—viz., that a larger yield of fibre was obtained by it, that the colouring matter was discharged by the most simple means, that greater strength was obtained, and less tow produced. The result was, that, after an expenditure of £6,000 in introducing the system throughout the country, the Linen Board abandoned it, in consequence of insuperable defects. In 1816, a Mr. Pollard, of Manchester, brought forward the dry preparation system, and proposed to make an article from flax which could be spun on cotton machinery. This also fell to the ground. In France and in Belgium similar trials were made, which turned out equally unsatisfactory. Your sub-committee are of opinion that the fatal defect of flax fibre, separated by the dry process, consists in the retention of the gummy and albuminous matter incorporated with the fibre. This being fermented by moisture at a moderate temperature, and decomposed by alkalies and acids, is not only useless, but absolutely pernicious if thus retained, since, in the processes of manufacture, when it necessarily undergoes the action of all these changes, it must come away. The case, therefore, as regards steeped flax and dry prepared flax, simply stands thus:—In the former state a nearly pure fibrous matter is produced, and the material is thus in the fittest state for spinning even yarn and making good linen; in the latter, along with the fibre is combined a foreign substance, which must be got rid of afterwards, to the detriment of the spun and woven products.

Although this appeared evident to the committee, when discussion was first raised relative to Donlan's invention, yet, anxious to investigate it more fully, with the chance of finding something practicable in it, they proposed that he should bring over his apparatus to Belfast, when, in the presence of practical persons, its merits should have the most careful and impartial consideration; and, if this should result in anything satisfactory, the Society would give its influence freely in introducing it. This proposition was not complied with. The committee then sent your secretary to London, and forwarded some flax straw for a trial; but, although there for several days, he was unable to get a sight of Mr. Donlan or of his apparatus. On leaving London, he requested Mr. J. G. Marshall, M.P., to have the kindness to investigate the matter, and that gentleman deputed his brother to undertake it. The following letter from Mr. Arthur Marshall contains his opinion:—

"*Leeds, Nov.* 11, 1850.

"DEAR SIR,—My brother has asked me to reply to your letter about Mr. Donlan, because I have seen his process, and my brother has not seen it. We sent some straw from Patrington, both rated and unrated. The samples I saw from each of the lots were well swingled, but at what expense I did not learn. The process appears to me tedious and expensive, as far as I could judge from the small quantity that was swingled when I was there. The unrated flax was extremely coarse, and only suitable for the purposes named at your committee meeting. I had previously advised Mr. Donlan to have some quantity swingled of the same straw, rated and unrated, and to submit the result to some flax-spinner; but I am not aware that he has done so. If he wanted to test the value of his invention, I think he cannot do better than adopt your suggestion, and bring his machinery over to Ireland. I saw quite enough to convince me that the process would not be suitable for us to adopt at Patrington. However perfect you may make the swingling, I cannot see how it is to sepersede the action of fermentation, in dividing the fibres.

"I remain, yours truly,
"ARTHUR MARSHALL.

"James MacAdam, Esq., jun."

On receipt of this letter, Mr. Marshall was written to for permission to make it public, and he replied as follows:—

"*Leeds, Nov.* 25, 1850.

"DEAR SIR,—In reply to your letter, my brother and I have no objection to your communicating to the society the views we take of Mr. Donlan's mode of treating flax straw. We sent to Mr. Donlan some flax straw from Patrington, of good average quality, part of it rated straw, and part unrated straw. I was not able to attend a meeting of gentlemen at Mr. Donlan's place, when samples of this straw were swingled, and the result published; but I called soon after, and saw the result. I also saw a small quantity swingled by one of Mr. Donlan's workpeople. The flax was certainly very fairly swingled, both that which had been rated, and the unrated straw; but I could not perceive anything new in principle in Mr. Donlan's machinery, and the process appeared to me to be tedious and expensive. This is confirmed by Mr. Donlan's printed statement, where he estimates the cost at £4 6s. 8d. per ton of flax straw swingled; and at the rate of two tons per acre this would be £8 13s. 4d. per acre, for labour only, at a low rate of wages, 1d. per hour for men, and 0¾d. per hour for women. The quality of the unrated flax was very poor, although apparently strong; but, if the material was spun wet, I should doubt whether the yarn would be stronger than yarn from rated flax. Mr. Donlan's object appears to be to produce a strong, coarse article, for manufacturing into sail-cloth and other fabrics of that description. Our object at Patrington being to produce flax of fine quality, which we consider the more profitable of the two, Mr. Donlan's plan appeared unsuitable for our purpose, and we thought no more about it. As to the plan of bleaching the flax fibre, and producing a substitute for cotton, we do not know anything about it; but it is not a new idea, and we should expect, from the result of former experiments, that, owing to the great difference between flax and cotton fibres, however the flax may be managed, the cloth produced will still be very different from cotton cloth. It is very important, however, that the matter should be thoroughly investigated by competent judges, because the announcement of such a plan tends to unsettle the minds of parties who are disposed to erect steeping concerns. We ourselves, however, have not been deterred, by this cause, from carrying out an extention we had begun of hot-water steeping vats at Patrington.

"I remain, your obedient servant,
"ARTHUR MARSHALL.

"James MacAdam, jun., Esq."

In August, Mr. Price exhibited to the committee a collection of samples illustrating Donlan's processes. One series shewed the flax fibre as separated by the dry mode, some tow from the same, and some coarse fabrics made from it. The fibre appeared coarse, harsh, and wiry, deficient in spinning quality, but very strong. It was considered value for about £30 per ton, and suitable for ropes, canvass, rick-covers, &c., especially if these fabrics were pitched or oiled, so as to prevent the action of air and moisture on the foreign matter which the fibres are combined with. The tow, valued by Mr. Price at £84 per ton, was considered worth not more than £28. The other series of samples consisted of flax fibre, partially or wholly bleached; and of thread and linen alleged to have been made from it. A considerable improvement was manifest in these specimens, evidently owing to the foreign matters having been partly got rid of by chemical means. Still, none of them appeared to possess that softness and mellowness which steeped flax, simply scutched and hackled, when of fair quality, displays. The committee were rather disposed to consider these samples as curious and interesting, than as likely to be useful, since it has long been an admitted axiom that the bleaching process cannot be so judiciously employed on the flax fibre, or even on yarn, as on the woven fabric. Many persons have experimented on the bleaching of fibre; and the committee are in possession of samples much more lustrous and silky than any Mr. Donlan has shewn, but no practical end can be attained by their employment. Within the last week, some flax straw has been prepared near Belfast, part of it by steeping, and part by the dry process. The samples are before you, to shew for themselves, the steeped lot being more than double the value of the other.

Having thus reviewed the products of Mr. Donlan's so-called discovery, your sub-committee would add a few notes on the paragraphs which have lately appeared in *The Morning Chronicle* in support of this project. In so doing, they must express their decided opinion that the author of these articles is extremely ignorant of almost all the circumstances connected with the culture and manufacture of flax. In fact, this ignorance is so constantly apparent, that to take up the errors *seriatim* would require a separate report. Your committee's remarks must be therefore confined to a few of the most prominent:—1st. It is stated that Donlan's process (unlike all previous plans) is simply effected by mechanical means. Now, it is a well-known fact that Lee's process and others were effected by mechanism only. 2nd. It is stated that the dry process retains all the oleaginous properties of the flax, and is therefore superior to the steeping system. The very reverse is the case, as dry-prepared flax is rough and harsh, while steeped flax is soft and mellow. 3rd. It is stated that flax fibre is injured by steeping, and receives various impurities. Now, steeping is the only mode of getting the fibre *free* from the impurity which the dry process retains. 4th. By steeping, flax is deteriorated in value. As a proof of the contrary, none of Mr. Donlan's flax has been valued at more than £30 per ton, while good steeped flax averages £50, and often reaches £80 per ton. 5th. Kiln-drying is named as a usual process; whereas it is well known that, except in a few localities, it is now never employed. 6th. The *shoves*, or woody refuse of the stems, are recommended for cattle, while science and practice have both proved them utterly valueless for such a purpose, and they are with difficulty made available even for manure. 7th. Saturation of the seed in a chemical solution is alleged to increase the fibrous part of the plant. So small a portion as the seed would imbibe could scarcely be expected to act sensibly on the constitution of the plant; and the husk of flax-seed is known to be impervious to liquids; so that, however its exterior might be affected, the kernel, which contains the germinating principle, would remain intact.

But all these errors sink into insignificance, compared with the calculation that 100,000 acres of dry-prepared fibre would give £2,800,000 more value of fibre than the same quantity steeped. Even granting the correctness of the allegation that double the produce of dry-prepared flax could be obtained from the straw, it is evident that, since the former is valued by competent judges at £30 per ton, while the latter, as steeped on Schenck's system, has actually averaged nearly £60 per ton in the Belfast market, this assumed advantage is at once negatived—the value remaining almost precisely equal. And, while the latter could be applied to all the purposes of manufacture, the former could only be used for a few.

Your sub-committee do not deem it necessary to enter further into this inquiry. Sufficient evidence has been given of the entire want of solidity in the basis on which such flourishing, and, to persons ignorant of the subject, such plausible anticipations have been erected.

They will only further add, that the absence of all evidence supported by practical men, and the directly adverse testimony of the only practical person who has seen the process, should suggest the utmost caution to those whose sole means of judging are the perusal of newspaper paragraphs, or the inspection of nicely got up samples. They have entered thus fully on the subject, because they feel that the society has a two-fold duty to perform —in making its knowledge and experience available to guard the public from disappointment and loss; and in recommending the adoption of Schenck's steeping system to all who are interested in promoting the growth of flax, as having stood the test, after being subjected to a severe examination. They consider that it would be most unfortunate for the country if this more than doubtful project of Mr. Donlan should divert attention from it. While your sub-committee would most sincerely rejoice to find their unfavourable opinion of the latter incorrect, they feel it a paramount duty to issue a timely caution, both to flax-growers and to the promoters of the scheme, that the first-named may not rely too strongly on plausible appearances, neglecting the substance while grasping at the shadow; and that the last-mentioned, in their over-sanguine anticipations, may be induced to consider more carefully the data on which they found their calculations.

(Signed) ROBERT M'KIDBIN, M.D.
JOHN PRESTON.
JAMES MACADAM, Jun.

AGRICULTURE AND THE RURAL POPULATION ABROAD.

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LA BEAUCE.

"La Belle France" is in England generally held to be a phrase containing more of flattery than of truth; and, indeed, those whose knowledge of the country is confined to what they have seen from the *coupé* or the *banquette* of a diligence—hurrying on the great high road from the Channel to Paris, or from Paris to Switzerland by Dijon, or to Italy by Marseilles—may possibly appeal with great sincerity to their reminiscences of travel, as evidences of the correctness of the English view of French scenery. Fresh, however, as I am from a journey through one of the richest and most delicious valleys ever traversed by locomotive—I mean the course as far as Etampes, from which I write these lines, of the Paris and Orleans Railway—I cannot but wish that some of our sneerers at the soft beauty of French rural scenery could be indulged with a trip among the mingled vines, woods, coppices, gardens, and yellow corn-fields, which form that most luxuriant and smiling of panoramas. They would hardly for the future be so ready to dub France as a vast extent of open dreary country, patched here and there with sombre forests, and dotted with dirty straggling villages, or with repulsive, fortified, and ramparted towns. Leaving Paris by the route in question, the influence of the sweet south becomes sunnier at every step you take. Coppice-wood and hedge-row become more and more luxuriant. The grapes cluster thicker on the trellised walls, the meadow-grass grows more richly in the water-side pastures; gardens, unless trimmed and shaved, get to be perfect wildernesses of wanton vegetation; and the very poplars, stretching in their military *tenue* by the long, white, dusty wayside, appear, if possible, to be taller for their girth than their brethren in the north. From each side of the railway, as you fly through this favoured land, there stretch sunny slopes clustered with vines—undulating uplands which require little scientific aid to be rich with yellow grain—orchards, and clover fields—fresh bright patches of young thriving wood—and south-looking walls, all clothed in the foliage of nailed-up peach, and plum, and apricot trees—the whole green picture cut and cloven by swarms of intersecting country roads—hedged and shaded by bush and brier, diversified with white villas or villa-looking cottages—each rising in the midst of a garden as bright and glittering with many-hued and gaudy flowers as the field of a kaleidoscope, or marked here and there by a grey old chateau—all having high peaked gables and round towers with extinguisher roofs, and odd turrets and architectural excrescences without number, telling of the days when the great old *noblesse* of France ruled the land, and when poor Jacques Bonhomme, the peasant, was fain to drudge his dreary *corvée* in order that Monsieur le Comte or le Marquis might cut the more brilliant figure in the *salons* of Versailles or St. Germains.

Passing Etampes—a long, straggling, dull, dusty country town—the character of the country changes. We are entering upon classic ground in the agricultural world of France—a district, indeed, which might well be deemed monotonous in its features, or, rather, in its one huge and all-pervading feature, were it not for the irresistible grandeur of the scale on which nature has here worked, and the overpowering idea of inexhaustible fertility and boundless profusion called up by the limitless ocean, so to speak, of flat, rich, cornland, on which the traveller suddenly finds himself launched. As we approach Etampes, journeying along a shallow valley, its sloping sides vine-clad from top to bottom, we remark the long extending level sweep of the banks which on either side bound the view. For miles and miles they mark out the limits of a broad table land, and up to this level the railway has been gradually working through a long series of wearisome inclines. After Etampes comes the last and the steepest of the whole. The locomotive pants along through high chalk banks and cuttings, at the rate of some five or six miles an hour, until at length, after some twenty minutes of this hard pull, the pace improves, the heaps of chalk and dusty gravel fade away from the side of the line, and the traveller perceives that he has attained the level of a vast arable plain, which stretches away before and around him—the grandly spreading expanse as smooth as a billiard table—except, perhaps, here and there, where some hardly noticeable undulation heaves the land into long wavy swells, such as would mark the ocean in a time of the profoundest calm. This is the greatest flat expanse of land in the country. It is La Beauce—*par excellence* the granary of France.

Geographically speaking, the vast desert of corn land in question forms the broad table ground which divides the valley of the Seine from that of the Loire. Chartres, although lying rather upon its northern frontiers, is esteemed the capital of La Beauce, and there is held on Saturdays the ruling market for the price of corn all through France. In La Beauce, the production of grain is the grand industry to which all others are subordinate. The cattle bred are almost entirely for domestic consumption—so of the green crops—so of the small quantity of wine, and the still smaller quantity of cider manufactured. In the valleys which trench upon the frontiers of La Beauce are rich meadows and pasture lands; but once get fairly within the grand circle of the plain, and you find the cattle and sheep either fed in farm-yards or turned out to pick up what they can amid the scanty crop of herbage which springs up amongst the old stubble of fallow-lying lands. In the department of the Eure-et-Loire, of which the Beauce forms the greatest and the richest slice, I find by official returns the number of horses to be 40,000, and that of horned cattle to be 72,000. In the department of Calvados, again—better known to Englishmen as Lower Normandy, and which is about equal in extent to the district of the Eure-et-Loire—the number of horses is 80,000, and that of horned cattle 160,000. Out of the whole superficies of the latter province, which amounts to about 548,304 hectares—each hectare being nearly 2½ English acres—no less than 450,000 are regularly cultivated as corn land; 22,000 hectares, principally valley land, are devoted to pasturage, and the remainder are laid out in forests and vineyards, in grain crops and potatoes —the latter, however, forming a very small proportion of the whole amount. The average annual production of the department is estimated at 3,320,000 hectolitres, the oat crop producing annually about 700,000 hectolitres.

I have mentioned the striking effect produced by the first appearance of the Beauce while entering it upon the Etampes side, rising as it were through an under-ground shaft to the level of the surface of the earth. I have since been several days wandering from village to village across its ocean-like expanse, and I cannot find that the view, perfectly uniform as it is, becomes at all monotonous. There is a sublime of the plain as well as of the mountain—of the horizon bounded only by the powers of the eye and the curve of the earth, as well as of that cut out against the sky by mountain peak and sierra. In some portions of La Beauce hardly a tree is to be seen. From north to south, from the place of sun-rising to that of sun-setting, there is nothing in the summer time to be seen save corn and sky. Towards the southern extremity of the plain, however, dusty clumps of dwarfish-looking timber, with here and there a straggling row of twisted and unwholesome-looking elms and beeches, divide into devious compartments the great sweeps and swells of unfenced land. The sense of immensity produced by a landscape of this sort is very curious. You seem to be able to see to the very ends of the earth. The scattered clumps and broken lines of trees only carry on the eye, mile upon mile, and league upon league, until the dark and earthy yellow of the neighbouring stubble fades gradually into a uniform greenish hue—and that again into the duskiness of the extreme distance, with the blue sky bending down towards it, and cut in a sharp clear line by the long sweeping horizon. It is curious to mark how a great tree, or a steeple, or a windmill, miles away, shows upon this flat surface, just like a distant ship at sea. Occasionally a distant line of higher and finer timber than ordinary looks like a fleet heaving up in regular sailing order upon the horizon. And while upon the railway, I remarked how we "rose," as sailors say, far-off objects, distinguishing the peaked top, and faintly the twirling sails, of a wind-mill before we made out the body of the tower. Lonely and desolate in its far-spreading richness as the country seems, you speedily comprehend that the effect in question is produced by the immensity of the space overlooked rather than by any want of human or animal movement to enliven it. A tiny speck of flying dust catches your eye miles away. It is raised by a ploughman riding his pair of horses to their work, by a country cart traversing some invisible cross-road, or perhaps by a comfortable-looking farmer's wife mounted between the panniers of a well-fed and gaily-caparisoned donkey, and trotting with her eggs and butter to the remote market town. Nearer you, perhaps, will be a shepherd pasturing his flock upon hard prickly stubble, which it seems a wonder the creatures can devour. The water-casks, scattered hither and thither where kine abound, indicate the great want of the Beauce—that of a sufficient and easily-attainable supply of water for cattle; while every now and then, as the eye ranges wearily over the illimitable waste, it catches sight of dim moving specks—peasant men and women at their field labour, or plodding wearily from village to village. As there are few or no small isolated dwelling-places in the Beauce, and, as mixed up with large farms, there are an infinity of small buildings, it follows that the villages formed of clustered peasant dwellings must be numerous. These are generally marked by surrounding clumps of trees, and from them extend, indicating the country cross roads, the irregular and scrubby avenues which I have mentioned. Sometimes these hamlets are crowned by a church spire, and a windmill or two are always to be found in their neighbourhood.

So much for the Beauce as a landscape. The soil is for the most part of a light friable clay, upon a dry gravelly bed. It is cultivated without anything approaching to drainage, upon an old-fashioned rotation of crop system. As is usual in France, stable and farm-yard manure is diligently applied to the land, and, so far as actual downright labour goes, there is not a square yard which is not worked as though it were garden ground. The following are, I am informed, the plans of rotation of cropping pursued in the Beauce, and more or less general over both the northern and the central corn-growing districts of France. 1st year, beans, well manured; 2nd, barley; 3rd, clover; 4th, wheat; 5th, oats, barley, or peas. Another system—1st, fallow, manured; 2nd, oats or barley; 3rd, clover, beans, or peas; 4th, wheat; 5th, oats. A third system—1st, wheat, well manured; 2nd, potatoes; 3rd, oats or peas; 4th, clover, slight manured; 5th, oats, or wheat, or barley. When land is rented in France, the course of cropping to be adopted is usually indicated in the lease. In the Beauce, as well as in most parts of the country, leases are ordinarily drawn up for periods of nine, eighteen, or twenty-seven years; and there are fixed breaks when either party can get rid of the obligation. Ordinary stipulations in French leases bind the farmer to pay the taxes falling upon the land, to take upon himself the charge of the necessary repairs, so as to keep the farm buildings in proper order, not to sublet without the consent of the proprietor, and to consume all the straw upon the farm. In some parts of the corn-growing country a curious sort of tenant-right prevails. At the expiration of a lease the farmer may offer to renew it again at a higher rate than before. If the landlord refuse, he is bound to pay his tenant down, in ready money, three times the amount of the proposed yearly increase. Thus, suppose I rented a farm at 80 francs the hectare—not an uncommon rate—and offered at the expiration of my lease to renew the obligation at the rate of 85 francs, the landlord, if he refuse, is bound to pay me down 15 francs per hectare as an allowance for the improvements which I have made, and the capital I have expended upon the land. In this manner the tenant has a hold upon the proprietor, who must pay, if he wishes to eject; while, on the other hand, there is little danger of the farmer exaggerating the value of his improvements, as he may be taken at his word, and may be made to pay the increased rent reasonably to be expected from the increased productiveness and value of the land.

In the Beauce, however, and indeed throughout France very generally, I am assured that landlord and tenant get on in a very peaceable jog-trot manner, and that the same family remain for ages the cultivators of the same farm, employing in turn, as labourers and servants, generation after generation of the neighbouring peasantry. For it must not be forgotten that the latter, in many parts of the country—small landed proprietors as they commonly are—are also very frequently hired labourers upon the larger farms which ever and anon intersect their small holdings. This is especially the case in the Beauce, where the small estates are very small indeed, but where, fortunately for the people, they generally obtain employment upon the larger *exploitations.* In making their agreement with the farmer, they stipulate for a certain allowance of time to be devoted to the cultivation of their own little patches of earth, and the ploughing, harrowing, and indeed all the work for which horses are required, is commonly performed upon these infinitely small divided morsels by the nearest occupier carrying on speculations upon anything like a large scale. It thus sometimes happens that a man finds himself ploughing his own land as the hired servant of another, but paying in his private capacity some ten or twelve francs per French acre to his employer for the services which he himself is helping to render. How land could otherwise be cultivated at all, since the estates are almost universally so small that no single one of them could afford to keep a pair of horses for ordinary rural labour, is a problem more easily put than solved. I hear now and then of a species of peasant joint-stock companies, intended to provide the members with the larger and more expensive class of agricultural implements to be used in turn by each. But the notion seems fraught with all manner of impracticabilities—an opinion indeed in some degree confirmed by the fact that the instinctive good sense of the people has led them to the adoption of the more common-sense and business-like plan of having the requisite agency from those who are willing and able to dispose of it.

The small farms in the Beauce district, I am assured on all hands, have been for some time, and are rapidly becoming, still smaller. The district is so purely agricultural that it is not easy for the sons of little landholders to work themselves into any other occupation than those more or less connected with the soil. Thus they hang about their native district, and receive, when their time comes, their infinitesimal shares of the rapidly dwindling patrimony. I asked an intelligent labourer, who was winnowing his own little heap of grain at his own barn-door, what he thought the subdivision would ultimately end in. "Why," he said, "in this"—and he drew with the toe of his sabot a circle of about a foot in diameter upon the ground—"each man will have just enough of land to stand upon." So far as I can yet see, the great farms still existing in rural districts, and the various promising branches of industry open in other provinces, either in the country itself or in large towns, are the chief safety-valves upon which depends the very possibility of the continued existence of the infinitesimally splitting-down system. "As soon," says a French agricultural writer, "as a family possessing a regular-diminishing quantity of land begins to consume more than it can produce, so soon does the system begin to show its fundamental weakness. Obliged then to go and labour in the employment of their richer neighbours, they are able to give only an imperfect and unseasonable attendance to their own morsel of land. Possessing only, perhaps, a single cow or sheep, they have no means of procuring sufficient manure, and the consequence is that, small as is their portion of the soil, it is imperfectly cultivated, and its resources are only partially developed."

The first large farm which I inspected upon the frontier of the Beauce impressed me favourably not only with the rural economy of the district, but with the situation of farm labourers attached to considerable agricultural establishments. The farm in question stood upon the fertile table land rising on either side in long undulating sweeps above the town of Etampes. The general arrangement of the establishment was similar to that which I have sketched as the prevailing style of farm buildings in Normandy; but in cleanliness, tidiness of management, and compact and well-devised architectural structure, this Beauce farm-steading was at least half a century before its Norman competitors, and indeed for that matter as much a-head of many of its local rivals.

My request to be allowed to see the farm arrangements—proffered in the first instance to a venerable old gentleman, in huge copper spectacles, threshing in a goodly sized barn—was carried to the dwelling-house, forming part, but only a part, of one side of the great quadrangle which made up the establishment. Although it was then hardly eleven o'clock, the table, in a fine, hospitable, cosy-looking old kitchen, was laid out for dinner; the servants, male and female, were trooping in from field and out-house; and, hearing that M. le Fermier was *à la chasse*, I was about to retire for the time being, when up from the head of the table sprung a smart, middle-aged, little woman, with eyes like lustrous black beads, and a face which was all one bustling, busy, good-humoured smile. "I wanted to see over the farm." "So I should." "The *bourgeois* was from home?" "What had that to do with it? She had quite the management of the whole place. The bourgeois was a bachelor. She gave all the servants their meals, presided over household matters, and, with her husband, the principal labourer, governed if she did not reign. She would show me everything herself." "But madame's dinner?" "Madame's dinner was not to be considered. Madame had all the day before her to dine. Madame's dinner would keep hot; and if it did not, madame could have it warmed up again." And so, under this most obliging guidance, did I commence my perambulation of a fine specimen of the superior class of French farmsteads.

And first I liked the kitchen—which of course served for parlour and kitchen and hall to the swarthy bloused men and kerchief-coifed women who sat on either side of the long marble-topped dining table. The place was a lofty old-fashioned apartment, with a huge fire-place, over which hung —upon what in Scotland would be called a "crook" —a goodly stewpan, sending forth pleasant odours, while a regiment of auxiliary *casseroles* with long handles were ranged upon the walls. On one side of the fireplace was a convenient oven, and all ordinary kitchen furniture was amply provided upon a big rude scale, comfortably demonstrative of ease and snug good living. In a corner, upon long ranges of shelves, were arrayed rows of milk-pails and jugs, as brightly kept as they would be in a Devonshire dairy; and opposite to them was the high, old-fashioned, time-stained dresser, on which a great display of crockery—enormously thick plates, and most ponderous-looking dishes—was set out in glittering rows. As we left the room my conductress informed me that every person connected with the farm there took four meals per day. At seven they breakfasted upon soup or milk and *tartines* (huge slices of bread and butter); at eleven, the dinner hour, they had soup with *bouilli*, and savoury stews of vegetables and meat, with bread and wine, of which last three small tumblers was considered to be each man's fair allowance. At four they took the sort of afternoon lunch, known among the French peasantry as "the taste" (*le goûter*), the viands being bread, butter, cheese, and milk; and at seven supper was served, sometimes including soup again, with *bouilli* preparations of milk, and occasionally salads.

Leaving the kitchen, we proceeded by a winding stone staircase to the upper part of the house, where, as is usual in French farms, the threshed-out grain is stored. An uncomfortable and ill-devised style of management is this—jumbling up what ought to be the private apartments of the family, or at all events the living rooms of the farm servants, with the purely business portion of the establishment. The practice is, however, I understand, all but universal in France. In the farmhouse in question the garrets, which were very lofty, had originally been alone intended as grain storehouses; but the rooms on the first floor had been dismantled, and it was curious to see the remnants of painting and gaudy papering—in one of the chambers there was still a mirror attached to the wall—rising on either side of piled-up heaps of wheat, barley, and oats.

Stretching away on either side of the dwelling house ran on one hand the *hangar*, or shed for agricultural implements, with the stables; and on the other the cow-houses, threshing barn, and sundry store places, potato cellars, and so forth. All these erections were massively and firmly built, and creditably clean. One out-house was taken up with a range of rabbit hutches, the animals being lodged in successive rows from the floor to the raftered ceiling. I never saw larger or finer creatures of the kind. The biggest Ostender would have had no chance with them in a rabbit show. Their hutches were perfectly clean and fresh, and the creatures were in the finest condition for the kitchen. The flesh of rabbits, I was told, forms no inconsiderable portion of the food of farm servants in this part of France, and the animals are also occasionally reared for sale. The pigstye was kept quite as clean as the rabbit hutch which it adjoined. Its occupants had plenty of good litter, and never came out of their abode until ready for the butcher. The breed was very indifferent, the brutes looking almost as long-backed as eels. The careful manner in which the cows—they were fifteen, with one vicious looking bull—were kept, pleased me greatly. The hides of the animals glanced like those of well-curried horses, and their rumps and haunches displayed none of those clotting defilements, produced by lying down in dirty litter, which are occasionally to be seen at home. In case of need the animals were first scraped with a knife, then briskly curry-combed, and finally polished off with a hard brush —a cutaneous discipline obviously attended with the best effects. The horses in their stable opposite had no stalls, but abundance of good sweet-smelling litter. They were fed, like the cows, from stone troughs, in which hay and oats were indifferently put. In the stable slept two of the principal male farm servants. Their dormitory was rather a curious one, consisting of a sort of wide projecting berth, standing right out from the wall, between the rows of horses which occupied each end of the stable, and approached—it was fully six feet from the ground—by a ladder. In this species of nest a coarse but by no means uncomfortable-looking couch was spread. The usual occupants were the principal *charretier*, and, when he did not sleep in the fields, the shepherd. Apropos of what I have already said as to the locomotive nocturnal quarters of the latter functionary, it must be noted that he only sleeps in his wheeled house when a patch of land is to be manured by the flock. On these occasions the sheep are sometimes left all night upon the same spot, sometimes driven before morning to another, according as the nature of the land or the destined crop is held to require the application of an agency of more or less fertilizing power. Turnip-feeding for sheep appears to be quite unknown in this part of the world, the vegetable itself being by no means held in the esteem or reared in the abundance in which it is produced with us. Outside the actual farm yard, but still within the wide-sweeping walls of the establishment, were the sheep pens, the species of manger from which the animals cropped their dry food, the corn and hay stacks, and a goodly array of capital harvest waggons. In no respect indeed does it strike me that the French are more happy than in building vehicles for rough agricultural purposes. Their more pretentious conveyances are frequently melancholy botches—models of hopeless clumsiness; but their carts are capital things—light, and strong, and handy, excellently balanced on their high wheels, and exactly the species of carriage which the deeply-rutted cross-roads of the country require. The harvest carts—from the general disposition of which more than one idea, neatly carried out at our great annual agricultural shows, has been apparently taken—are long, narrow vehicles, highly and strongly fenced, and furnished with projecting and moveable framework before and behind, so as to increase or diminish the capabilities of the conveyance at pleasure. The main characteristic, however, of French cart-building is the immense weight put upon one pair of wheels. On any of the great thoroughfares you will frequently see six or eight horses yoked in a row, and dragging a great burden of merchandise so nicely piled upon so well-adjusted a two-wheeled cart, that the horse in the tram has little more to lift than if he were working in an ordinary four-wheeled waggon. Among the farm machinery around the steading in question—and I have since frequently seen the implement among the wide-stretching plains of La Beauce—was an odd-looking roller; its peculiarity consisting in a sort of gig-like seat being perched upon a frame-work above its centre, but only reared some three or four feet from the ground. Seated here, the driver's weight as well as his skill becomes available.

The farm servants in this, as in the other corn-growing districts of France, are usually hired by the year. My conductress told me that her husband's wages, which were the highest paid in the establishment, were 400 francs per annum. Her own were 300 francs; and as, in addition to her rural and household cares, she did the laundry-work of the whole concern, it will be admitted that she fairly earns the money. The gardener had 300 francs a-year; the shepherd, if I mistake not, the same—his dogs were fed at the farm. I may add here that in some parts of France, the north particularly, I believe the shepherds, instead of being upon fixed wages, are paid—in all cases in which the number of sheep kept is over 200—at the rate of 15 centimes, or 1½d., for every lamb, and 25 centimes, or 2½d., for every fat sheep sold. Besides this they enjoy the right of having 36 sheep kept and fed at the expense of the farmer. The girl who attended upon the cows in the field, and milked them at home, had 200 francs per year. The threshers were the only persons about the establishment who seemed to be upon piece-work. They were paid so much—about 24 sous, as I understood—per sack, and it was a hard day's labour to thresh a sack and a-half. The general duties of the servants attached to a large French farm may be thus briefly sketched. The *maitre charretier*, who is the principal employé, and the *cartons*, or *valets de charrue*, acting under his directions, have the charge of the horses, ploughs, and harrows, and convey the manure to the fields, and the grain and hay to town or market. The *garçon de cour*, or *goujar*, attends to the cattle in their byres, and provides them with food and proper litter. The shepherd devotes himself exclusively to his flock, superintends the fattening of the animals destined for the butcher, and is understood to be competent to doctor all manner of maladies incidental to his charges. The house female servants do the washing, milk the cows, make the cheese, bake the bread, and prepare the meals for their comrades of the fields. In smaller farms there is only one *charretier*, who likewise threshes in the barn, while the single house servant partly supplies the place of the *garçon de cour*. Besides the threshers, the labourers employed to mow hay and clover in the summer, and the corn in the autumn months, are often paid by the piece. The harvesters, again, who make up the sheaves, earn so much—generally not over 20 francs—per month. Those who form the stacks are somewhat better paid, and all of them, during the harvest months, are boarded like the annual servants of the establishment.

To return, however, for a moment to the Etampes farm. Like most large *exploitations*, it was most amply provided with garden ground, and besides the plot planted with flowers, fruit trees, and vegetables, there was a considerable space laid out in a fashion curiously indicative of French horticultural taste. The affair was, in fact, a species of maze, formed of a labyrinthine intricacy of green embowering alleys—the willowy-looking trees, or rather over-grown bushes, of which they were composed, meeting over head, so that you walked through tunnels of herbage. Here and there were little artificial mounds, the tops of which you could attain by a single hop, skip, and jump, but around which cork-screwy walks wound and clung, so that the ascent was rendered quite respectable, and you were rewarded for your pains by finding a pleasant peep-hole cut amid the trees, through which you caught, framed in clustering green leaves, a succession of bird's-eye views of the white houses of Etampes straggling along the bottom of the distant valley. There could not have been less than half-a-dozen of these mounds, and not one of them would my energetic cicerone hear of my shirking. She evidently considered the *allées* and the arbours to be the grand *coups* of the whole affair, and she was, besides, abundantly eloquent upon the number of hares with which the *parc* was stored, and upon the capital sport it could not but afford to set nets amid the green alcoves and then hunt poor timid puss up and down into the snares. The dinner hour was long gone by ere madame could persuade herself, in the pride of her heart, that the Englishman had seen half the wonders, and appreciated half the beauties of the mazy walks, the seat-crowned mounds, and the elaborate summer-houses which decorated the fresh green gardens of that well-kept, comfortable-looking, and, I sincerely hope, very prosperous farm.

My subsequent researches in La Beauce, however, by no means tended to keep up the good impression produced by the business-looking state of things in the Etampes farm. Penetrating well into the plain, I took up my head-quarters at an unheard-of little place called Loury, a perfect specimen of a Beauce agricultural village; and making *détours* all round it, I visited at least half a score of large farming establishments, and as many of the peculiar hamlets common in this part of France, of the main features of which I shall have a word or two to say presently.

I commonly found them—with here and there an exception when the farm buildings seemed to be of more modern date—great sprawling structures, massive and rude, forming filthy quadrangles, heaped from side to side with perfect Alps of dunghills. The coarsely-built walls were often dilapidated and crumbling. The undulating expanses of roof showed that the beams were bending and starting beneath their load of moss-grown grey slates. Broken ploughs, and fragments of rotten harness, dilapidated cart-wheels, and bottomless baskets would be strewn here and there amid the jumble of little unpainted doors swung open, and often hingeless, in the wind; and under the tottering roof of the open cart-house poultry would be roosting by scores upon the trams and tilts of the vehicles, huddled higgle-piggledy beneath the shelter. In all, or nearly all, of these farm-yards, close by the well, was to be found a green stagnant pond, for the benefit not only of the ducks, but of the cattle. Water in this part of the country can only be obtained by sinking very deep wells, and every drop is therefore valuable. In some of the better kept *basses cours* great tub-fulls are provided for the cattle and horses, and in many cottages one of the most conspicuous of the articles of furniture is a small cask of the limpid fluid hung up for the domestic purposes of the day.

I hardly expected, in a large farm-yard in the acknowledged granary of France, to witness an agricultural operation, which, if it exist at all in Britain, must do so in the Orkneys, or some such nook as far removed from the influence of agricultural societies, and from the principles and practices of high-farming. In fertile and favoured La Beauce, however—and that not in the holes of barns belonging to the small proprietors, but in a structure as roomy as a good-sized church—I found the labourers hard at work winnowing, flinging the chaff and grain by huge wooden spade-fulls into the air, and leaving the separation of the husk from the corn to the care of the thorough draft which was blowing through the barn, sending a stifling cloud of dust and chaff flying out into the farm-yard. In other cases I found the process performed by means of sieves, but many of the barns are built with opposite doors to the east and west, the most common course of the wind, obviously for the sake of practising the primitive species of operation in question. *Apropos* of the subject, I noticed the other day a paragraph in a provincial paper of the west of France, mentioning the introduction of winnowing machines into this district, stating that they were being conveyed from farm-yard to farm-yard, and were greatly exciting the admiration of *messieurs les cultivateurs*. The sooner these artificial wind-makers make their appearance in the Beauce the better.

A somewhat singular appendage to the farm-yards in this part of the world is the *pigeonnier*, or pigeon-house. It is invariably a good-sized round tower, looking like half of a respectable-sized light-house, and having a shelving roof, garnished with certain trap and cap-looking structures at the top. The rearing of pigeons is indeed no unimportant matter in the economy of the farm-yard. The birds are very cheaply kept, breed very fast, and furnish a standing dish at the eleven o'clock dinner in the old-fashioned kitchen. In several of the farms I visited they told me that they had from 300 to 500 pigeons. The dwelling appropriated to their use is generally divided into two unequal parts. A compartment about five feet high upon the ground floor is given up to the poultry, who roost here, frequently amid the most extraordinary dense masses of dusty cobwebs I ever saw. Above them dwell the pigeons. In their portion of the house the walls are constructed honeycomb fashion, the birds building and hatching in the hundreds of square holes thus provided. They always, however, roost upon perches as close under the roof as possible; and grand was the commotion, the flapping and the fluttering above my head, as I made my appearance beneath, and some score of birds flung themselves off their perches to escape through the narrow aperture allowed them. The French agriculturists account the manure produced in these places, and which is in fact a sort of guano, to be an exceedingly forcing stimulant for the land.

Scattered over the Beauce there are, as may be expected, hundreds of windmills, the structures being in all respects similar to our own old-fashioned buildings of the kind. Around Loury, however, I observed that many of them were uninhabited and evidently falling to decay, while, looking round, I soon discovered the cause of the phenomenon in a high chimney and a pennant of smoke streaming away over the old-fashioned roofs of the village. A steam-mill, established there about four years ago, has well nigh metaphorically, if not literally, taken the wind out of the sails of its more primitive brethren. There are a few other steam-mills upon the Beauce, but none within a circuit of many leagues from Loury. No inconsiderable portion of the Beauce grain is, however, ground by the forty mills of Etampes. These are all moved by the hard-working water of one clear rivulet, and are very business-like and unpicturesque affairs. The machinery of several is English. The mention of the Etampes mill stream recalls me for a moment to the exquisitely rich meadows through which its waters flow. The eastern side of the town is girt by a beauteous belt of these "pastures green," left absolutely in a state of nature—rich to rankness, never ploughed, never manured, never drained, never tilled in any way—but yielding three crops of wild grass and clover, the finest herbage I ever saw, every summer.

The few dark streets of Loury are curious places. Here dwell the mass of the small landowners—many of them, as I have explained, farm-servants, also—of the immediate neighbourhood. One thoroughfare especially struck me as being peculiarly characteristic in its purely bucolic features. It was a street of miniature farm-yards; on either side ran the cottages, the barns, and the cow-houses of the people, all crammed and squeezed together, so that it was often but a single step, through a single door, from the dwellings of the two-legged to those of the four-legged inhabitants of the place. There were no pigs in the parlours, luckily; but there was frequently only a crazy partition between the cow and the kitchen. The jumble was extraordinary. Bedrooms opened into barns, and sheaves were being threshed—women being frequently the operators—in the passages, and on the thresholds of living rooms. As for the pavement it was one continuous dung-hill, only varied now and then by a great stagnant pond, in which flocks of ducks would be cackling, and groups of patient cows standing laving their dirty legs—foot communication being carried on by means of scraps or ledges of high pavement on either side of the way. The houses were poor, filthy, slovenly, and had a continuous tumble-down look; but still the bleak signs of real pinching poverty were altogether absent. It was the hour of the *goûter* when I first adventured into the locality, and groups of swarthy men, women, and children were clustered upon every threshold, clasp-knife in hand, intent upon great hunches of very coarse brown bread, and very clayey-looking, white, soft cheese. The younger children had messes of some sort of milk-sop, served in the curiously massive earthenware used in the district. Inside the cottages the main articles of furniture were always the bed—generally pretty comfortable-looking—an antique old clothes-press, and a heavy dresser furnished with crockery. From the smoky rafters hung great bunches of dried herbs, ropes of onions, and lots of hemp, to be converted into thread by the busy spinning-wheel of the grandmother of the establishment. An English eye could not help looking in vain for the substantial sides and flitches of bacon which would assuredly garnish one of our cottages of the same class. Not a stye, however, did I see, not a grunt did I hear, throughout the whole town; and the fact seemed the more surprising, inasmuch as from the way of life of the peasant proprietors, a considerable surplus of refuse vegetable matter, on which pigs would thrive to their hearts' content, is very generally flung out of doors.

During one of the days I stayed at Loury the weekly market took place, and perhaps a couple of score of carts of all sizes, generally nicely tilted and well canvassed in, conveyed goodly stores of fruit (melons in particular), and swarms of crates choked full of pigeons and rubbish to the town. These carts were in almost all cases drawn by horses, and a most unruly set they were—neighing, and kicking, and plunging, as soon as they found themselves tied in line, down an avenue of shady old trees. A few sacks of corn were exposed for sale, and I observed that intending purchasers took good care to scoop out a sample handful from as far down the sack as they could well manage. The wares which the country people purchased in return were principally salt herrings—suspiciously soft and intensely briny they looked—and the ordinary groceries. A few stalls laden with coarse articles of dress, sabots—a style of *chaussure* which, by the way, is becoming quite dandy in its cut, compared with what it used to be—vest-laces and stay-laces, handkerchiefs, and so forth, were exposed; and near them were stalls glittering with hardware, the very look of which would have driven a Sheffield grinder mad. More unmitigated lumps of clumsily fashioned soft iron were never sold under the false pretence of their being steel knife-blades. The carts bearing the goods I have spoken of were commonly attended by a race of the most powerful and savage-looking dogs I ever saw. These enormous *chiens de garde* are common in the Beauce. You continually see them trotting by themselves across the fields, and such is the enormous size of the brutes, that the first I caught sight of—his huge gaunt frame relieved on the top of a long swelling undulation, against the bright sky—actually inspired me for a moment with doubts as to whether I was gazing at a very big mastiff, or a not very big calf. The shepherds' dogs are not much smaller, and ten times more intelligent-looking. Their long pointed muzzles make one think that the breed has been originally dashed with vulpine blood. At my request a shepherd tested the comprehension of his four-legged assistant. I had made my way to him to ask about an ugly breed of sheep occasionally seen here, with numerous clumsy folds and piles of skin encircling their necks as with collars; but I could only learn that such sheep were common in the district, and that the circumstance in question was the only thing peculiar about them. So we talked of the dog instead. The latter was sitting quietly beside us, when his master, without looking at him, or changing in the least degree either his attitude or the mumbling tone in which he had been speaking, said something which the dog understood much better than I did, for off he went, barking as though he were mad, and in a moment the scattered flock were arranged in a compact circle round us.

I have mentioned the Beauce hamlets—not the villages upon the great highways, or those which seem to have clustered together round a church—but the groups of habitations in which the small farmers commonly live, and which are placed as near as may be, in a common centre, to the patches of land parcelled out among their inhabitants. Those places are marked by features which never exist in English villages. Gazing from the outskirts of Loury, and mounting a crumbling earthen wall, from the top of which you can see some four or five leagues further, the traveller may discern many of the hamlets of which I speak. They look like dusky masses of thatch, with here and there a patch of dull grey stone wall, half swallowed up in dark green trees. Let us make our way towards one of them. During my stay in the Beauce, and my ramblings from one to another of these hamlets, there prevailed a long-continued drought and an intense heat. From morning to night the blue vault of the sky stretched without the fleck of a cloud, like a vast hot dome above the swelling plain. The earth was white with thirst—the parched trees were powdered with the fine flying dust, and as you gazed around, distant spires and windmills, and long straggling avenues, seemed quivering in the trembling transparent vapours into which the lower strata of the air were resolved. Sometimes there were even slight effects of mirage. A segment of the far horizon would appear suddenly flooded, as with a gleaming lake. Then, when the air was at its stillest, and the heat at its greatest, was the time for the grasshoppers. Amid the flour-like dust of the cross-road, they hopped round you in myriads, on every dry clod of grey earth, on every parched blade of grass, on every grisly stump of fading stubble. The hot air was laden with their never slackening voices. It was as if the whole vast plain were a prodigious mass of grasshoppers, sending up one low, steady, unwavering strain of tinkling music.

Pursuing your way, in due time you reach the dusky buildings of the Beauce hamlet. It is nearly what the back street of Loury was—a congregation of dwelling houses, barns, stables, and byres, and no more. From twenty to forty families may inhabit the place, yet there is not a single apology for a shop. Every household article which is not home-made must be procured miles away. The most common groceries, the most ordinarily used articles of earthen or hard-ware, must be fetched upon market days, or by a special messenger from the nearest village. In English rural districts we could hardly find a dozen houses clustered together without a humble chandler's shop, and perhaps a forge, and a house of entertainment, established among them. But these French hamlets are curiously destitute of the elements which go to lay the foundation of a labour-dividing and self-supporting community. You wander through a devious street of dung-hills, bounded on either hand by roughly-built cottages, straw-thatched barns, bristling with rude agricultural implements, and flanked by whitewashed walls, trellised all over with vines and peach trees, enclosing mountains of stable litter, and crowned every now and then with a quaint peak-roofed pigeon-house. There appears to be no social difference, no distinction of rank, among the people. Pierre may have a dozen more sheaves of corn in his house than Jaques; but in appearance, dress, habits, and pursuits, every man, woman, and child, is the fac-simile of his, her, or its neighbour. Plodding on in their unintelligent and dreary round of unskilled agricultural industry, hard and constantly worked, but not ill-fed, they vegetate contentedly on, little interfered by or interfering with the outward world, the child representing his father just as the father represents his next-door neighbour. And so, on a similar principle, things proceed in the larger villages and small agricultural towns. There of course are handicraftsmen and shopmen of different degrees; but still the inhabitants are apparently upon very much the same social level. There is a most noticeable want of resident gentry; or, at all events, of a professional class who might to some degree leaven with higher social instincts and more refined social usages the sluggish mass of the rural population. But in purely agricultural France you look in vain for the trim villa-like mansion, or the neatly kept rectory. In petty towns you scramble through insignificant streets of glaring white-washed houses; in farming hamlets you make your way amid crumbling barns and piled-up stable litter; but the people seem of one unvarying caste—little farmers, and petty tradesmen dependent upon farmers. The blue blouses and slouched caps of the men, and the white skull caps and brown-tanned faces of the women, are not more monotonous to the eye, than is the eternal iteration of specimens of the same social degree, and the same habits of mind, and speech, and life, to the moral sense.

ROTATION OF CROPS.

There are few things which require the exercise of more judgment in farming than the selection of a judicious and well-chosen system of rotations of crops. It is not only that we must alternate at least one crop of green fodder with a crop of corn, but there must be an ever-varying change of the kinds both of roots and grain, before any very successful system of farming can be pursued. The time is gone by when any *one* system of alternate husbandry can be considered improving for ever; and the four-course or Norfolk system, instead of effecting this, is found to be capable of being pursued until the land may be absolutely exhausted. The Duke of Portland, in a recent letter to his tenantry, shows this most satisfactorily; and takes the opportunity of giving his practical knowledge to his tenantry to overcome the disadvantages which follow from a too close and too rigid adherence to the alternate or four-course system of husbandry. A rotation, properly understood, should be a rotation not of regularity but of *change*. There must be a change not only of the general character of the crop, but a round of individual changes in detail, which will be found to modify each other's effect on the soil in such a manner as to keep up a degree of general fertility known technically as keeping the land "in heart."

The theories of a rotation are so numerous, that to review them in all their intricacies would be to spin out this paper to a length which would be inconvenient; but they resolve themselves into three classes. The first is that of Decandolle, who held that each plant exuded from its radicles some principle poisonous to those of its kind; and by germinating beans in water for a succession of cases, showed that an unhealthy development was the result. Another and no less plausible theory succeeded, and was believed to have exploded Decandolle's theory: this was from the school of Liebig, and went on the assumption that as one plant deprived the soil of one mineral ingredient in which it was abundant, as shown by analysis, and a similar kind of plant would starve for want of its principal sustenance; so another kind of plant containing but little of this deficient material would grow and thrive; and hence he laid down a succession of crops, showing, by chemical analysis, as great a difference as possible in the proportions of their *mineral* constituents. A more recent, more plausible, and, we think, a truer theory, is that the mineral and organic constituents both have to do with rotations—that there must be a reciprocation of both; and to have a soil as fertile as the circumstances will admit of, is to have one in which a proper relation is kept up between the organic and the inorganic elements. Thus a plant which derives most of its elements from the air, as carbon, oxygen, &c., will be well succeeded by another which is abundant in mineral matter, and *vice versâ*. But there is another principle to which more credit is to be attached than we think it generally obtains, and that is the *place* in the soil in which a plant feeds, as well as the food upon which it feeds. One kind of plant, for instance, has a shallow set of filaments, which run near the surface of the ground, and spread in all directions in a lateral manner — this feeds in the surface soil; while another is found to derive nearly all its sustenance from the subsoil. Now it must be clear that the two plants, though to a certain extent feeding on the same materials, may succeed each other, for they live in different strata of soil. This is, to a certain extent, true of the bean, as against the wheat or the barley plant say, and the clover; but it is a truth so general that the majority of plants require for their food a class of substances so common to all that they all exhaust the land, if taken away from it, of much the same materials. For instance, green crops as well as "grey," take away ammonia and phosphorus and sulphur and potash; and the essential difference to the occupier between growing the one and the other is simply this, that while the grain crop is generally sold off the farm, the green crop is almost invariably returned either on the soil on which it grew, or at least on the farm, and reacts as a fertilizer by the increase of the manure heap, or the improving of its qualities.

The too rigid pursuit of the four-course system has made sad havoc with some of our most productive crops. Thus, when that system has been continuously persevered in for a long period, nearly every crop exhibits signs of deterioration. The turnips go off by acres together by the obnoxious disease known by an expression more expressive than elegant, viz., "fingers and toes." The clovers throw out at certain periods, and leave a bare profitless piece of ground beneath them, and the land is significantly enough described as "clover sick." The cereals seem to suffer somewhat less if the soil be in general good condition, but even with them there are signs of defects either of quantity or sample. And what is the remedy? We say rotate more minutely. A crop of beans or tares will effectually secure a growth of clover in the subsequent course. A crop of swedes or rape will *live* on a field subject to "fingers and toes;" but to eradicate this disease, it is necessary to place the turnips eight years perhaps from its congeners, and thus no danger of a failure need be apprehended. A soil too light or too rich for wheat, one which will make its root-welt in the spring, may be successfully sown with oats, and if there be obstacles to barley of a very formidable kind, which seldom happens, a crop of rye will be found substituted to advantage.

But the range of crops is by no means very extensive; and hence the system of *rest* for soils is often found, with our present degree of knowledge, to be necessary to keep up the condition of the land. Hence land in Scotland is often allowed to lay away two or three or more years in grass to rest; and strange to say, this is sometimes a palliative to even "clover sickness."—Gardeners' and Farmers' Journal.

GREASE FOR CARTS, &c.—The following composition is recommended by a writer in the *Independance Belge* for greasing carts and other agricultural implements:—Take 4lbs. of caoutchouc dissolved in a proper liquid, 1lb. of gelatine, 10lbs. of carbonate of soda, 45 quarts of animal or vegetable oil, and as much water; boil the water with the carbonate of soda and gelatine, then add the caoutchouc and the oil, stir the mixture well until it forms a homogeneous liquid. The above proportions may be varied; and if the caoutchouc and oil are previously purified, the carbonate of soda is unnecessary. The above mixture will be found very useful, not only for greasing carts, &c., but also for keeping the farm harness in order.

THE CULTIVATION OF THE TURNIP.

LOCKERBIE FARMERS' CLUB.

We have much pleasure in laying before our readers the following valuable paper on this important subject, the result of the painstaking inquiries set on foot by that excellent practical institution, the Lockerbie Farmers' Club:—

TABLE SHOWING THE WEIGHTS OF TURNIPS

ON VARIOUS FARMS IN THE MIDDLE AND UPPER DISTRICTS OF ANNANDALE,

Inspected between 4th and 11th November, 1850.

			WEIGHT.				MANURE PER SCOTCH ACRE.					
NAMES OF FARMS AND KIND OF TURNIPS.	Width of Drill in Inches.	No. of Turnips on 10 yds.	Per Scotch Acre. Tns.	Per Scotch Acre. Cwt.	Per Imp. Acre. Tns.	Per Imp. Acre. Cwt.	Farm yard dung. Cub. yd.	Guano. Cwt.	Guano. Kind.	Dissolved Bones. Cwt.	Ground Bones. Bush.	Date of Sowing.
HARDGRAVE, DALTON,												
Swedes, ..	27	24	40	6	31	19	15	2½	Peruvian	1¼	12½*	23rd to 28th May
Ditto, ..	27	25	35	1	27	16	15	2½	Do.	1¼	12½†	18th to 21st do.
Hardy Green, ..	28	23	38	5	30	7	15	2½	Do.	1¼	12½‡	11th June
Ditto, ..	28	25	34	10	27	7§						..
Ditto, ..	28	26	39	4	31	2		7½	Do.			..
White Globe, ..	28	26	36	15	29	3	15	2½	Do.	1¼	12½‖	13th June
GREENHILLHEAD, LOCHMABEN,												
Swedes, ..	27½	39	35	3	27	17	26	2½	Do.			25th May
Ditto, ..	27	33	26	3	20	14	28	3½	Sal. Bay			30th May
Yellow Bullock,	27½	43	24	19	19	16	28	3½	Do.			31st May
PRESTONHOUSE, LOCHMABEN,												
Swedes, ..	30	34	32	0	25	8	18	2	Do.		8¶	18th & 20 May
Yellow Bullock,	30	32	34	0	26	19	18	2	Do.		8**	1st June
SMALLHOLM, LOCHMABEN,												
Swedes, ..	28	39	31	3	24	14	15	2	Peruvian		8	20th May
Yellow Bullock,	29	48	26	14	21	4	15	2	Do.		8	1st June
DALFIBBLE, KIRKMICHAEL,												
Swedes, ..	27	32	39	3	31	0	12	2	Do.	12		13th to 30th May
White Globe, ..	27	33	46	4	36	13	16	2	Do.			25th May
HILLSIDE, DRYFESDALE,												
Purple Top Swedes,	28	37	32	11	25	16	30	1½	Do.	2		18th May
Ditto, do., ..	28	34	35	16	20	8	30	1½	Do.		12	19th May
Ditto, do., ..	28	34	34	17	27	12	30				12††	..
Green Top do., ..	28	29	31	3	24	14	30	3	Do.			24th May
Yellow Bullock,	28½	30	30	19	24	11	25	3	Do.			8th to 12th June
Purple Top White,	28	31	30	16	24	9	25	3	Do.			6th June
KIRKBURN, DRYFESDALE,												
Swedes, ..	27	36	29	8	23	6	25	2	Do.		10	28th May
Yellow Bullock,	29	38	25	17	20	10	15	2	Do.		10	7th to 15th June
White Globe, ..	28½	39	34	15	27	11	16	2	Do.		10	15th to 18th May
BROOMHOUSES, DRYFESDALE,												
Swedes, ..	27	38	35	4	27	19	30	2	Do.			22nd & 23rd May
Yellow Bullock,	28½	40	20	13	16	7	28					17th May
White Globe, ..	28½	42	32	14	26	5	28					
PEELHOUSES, DRYFESDALE,												
Swedes, ..	30	35	27	19	22	3	30	1½	Do.			24th May
Yellow Bullock,	28	34	23	9	18	12	40					13th June
Ditto, ..	28	38	21	10	17	1		3½	Do.			7th & 8th June
SHILLAHILL, DRYFESDALE,												
Swedes, ..	28	41	28	0	22	4	18	2	Do.			23rd to 31st May

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* ⅝ bushel of bone sawings and ⅝ cwt. of superphosphate of lime added. † ⅝ cwt. of superphosphate of lime added. ‡ ⅝ bushel of bone sawings and ⅝ cwt. of superphosphate of lime added. § 7½ cwt. of superphosphate of lime added. ‖ ⅝ bushel of bone sawings and ⅝ cwt. of superphosphate of lime added. ¶ ½ cwt. of nitrate of soda added. ** ½ cwt. of nitrate of soda added. †† 2 cwt. of animal manure added.

Names of Farms and Kind of Turnips.	Width of Drill in Inches.	No. of Turnips on 10 yds.	Weight. Per Scotch Acre. Tns.	Cwt.	Per Imp. Acre. Tns.	Cwt.	Manure per Scotch Acre. Farm yard dung. Cub. yd.	Guano. Cwt.	Kind.	Dissolved Bones. Cwt.	Ground Bones. Bush.	Date of Sowing.
Millbank, Applegarth,												
Green Top Swedes,	29	43	29	1	23	1	20	2	Do.			24th & 28th May
Yellow Bullock,	28	47	27	8	21	15	20	2	Do.			4th & 6th June
Lammonbie, Applegarth,												
Green Top Swedes,	29	39	26	11	21	1	20	2	Do.			24th May
Yellow Bullock,	30	43	26	13	21	2		3	Do.		12	10th June
Ditto, ..	29	40	33	5	26	7		3	Do.		12	7th June
Muirhousefoot,												
Purple Top Swedes,	29	40	27	10	21	16	20	4	Do. & Pat.			18th & 21st May
Ditto, do.,..	29	27	34	16	27	12	20	4	Do. & Do.			..
Yellow Bullock,	27	46	28	8	22	10	15	3	Do. & Do.			1st & 4th. June
Dinwoodie, Mains, Applegarth,												
Swedes, ..	29	36	29	15	23	12	10	3	Peruvian			1st to 6th June
Ditto, ..	28	31	35	5	27	19	15	3	Do.			18th to 25th May
Yellow Bullock,	28	41	22	15	18	1	8	2	Do.			15th June
Dalmacadder, Applegarth,												
Swedes, ..	28	32	31	10	25	0	18	2½	Do.			20th to 30th May
Yellow Bullock,	28	41	25	18	20	11	17	2½	Do.			15th June
Hallhills, Applegarth,												
Yellow Bullock,	30	42	23	1	18	5		3½	Do.			1st to 15th June
White Globe, ..	30	48	21	5	16	17		3½	Do.			..
Kirkcroft, Applegarth,												
Yellow Bullock,	28	52	18	0	14	6	30					8th June
Red Top White,	28	54	28	19	22	19		5	Ichaboe			1st June
Rockhillflatt, Applegarth,												
Swedes, ..	29½	50	20	19	16	12	20	2	Peruvian			3rd or 4th June
Yellow Bullock,	27½	43	25	17	20	10		3	Do.			10th June
Ditto, ..	27½	52	22	9	17	16	20					..
Sibbaldbieside, Applegarth,												
Swedes, ..	29	56	26	0	20	13	25	2½	Do.			23rd May
Yellow Bullock,	29	52	24	18	19	15	30					31 May & 1 June
Cleughheads, Applegarth,												
Yellow Bullock,	28	43	18	4	14	8	25					
Ditto, ..	28	52	20	6	16	2		4	Do.			
Ditto, ..	28	50	22	1	17	10		4	Do.			
Nether Cleughheads, Applegarth,												
Swedes, ..	29	33	36	9	28	18	30	3	Do.			25th & 28th May
Johnstone-Mill, Johnstone,												
Green Top Swedes,	29	46	30	0	23	16	20	3	Do.			24th to 30th May
Yellow Bullock,	29	47	25	4	19	19	20	2	Do.			8th June
Johnstone-Cleugh, Johnstone,												
Swedes, ..	29	46	28	1	22	5	20	1½	Do.			25th to 30th May
Yellow Bullock,	29	48	22	6	17	14	20	1½	Do.			6th June
Greigsland, Johnstone,												
Purple Top Yellow,	28	42	23	12	18	15	15	2	Do.			
Yellow Bullock,	28	42	23	4	18	8	15				20	
Red Top White,	28	44	20	9	16	5	15					
Annanbank, Johnstone,												
Swedes, ..	28	35	32	18	26	2	20	1½	Do.			16th to 23rd May
Ditto, ..	29	34	31	9	24	18	20	1½	Do.			..
Yellow Bullock,	28	35	26	19	21	7	20	1½	Do.			15th to 20th June
Red Top White,	28	34	32	4	25	11	23	1½	Do.			1st June
Ditto, do.,..	28	29	33	12	26	13	20	1½	Do.			20th June
Goodhope, Johnstone,												
Swedes, ..	30½	46	32	3	25	10	32	2	Do.			23rd May
Yellow Bullock,	30	46	28	8	22	11	25	2	Do.			4th or 5th May
Purple Top Yellow,	30	42	34	0	26	19	25	2	Do.			4th to 5th June
Corsua, Johnstone,												
Swedes, ..	28	46	28	4	22	7	18	2	Do.			15th to 20th May

			WEIGHT.				MANURE PER SCOTCH ACRE.					
NAMES OF FARMS AND KIND OF TURNIPS.	Width of Drill in Inches.	No. of Turnips on 10 yds.	Per Scotch Acre. Tns.	Cwt.	Per Imp. Acre. Tns.	Cwt.	Farm yard dung. Cub. yd.	Guano. Cwt.	Kind.	Dissolved Bones. Cwt.	Ground Bones. Bush.	Date of Sowing.
Kirkhill, Wamphray,												
Swedes, ..	29	40	32	18	26	2	28	2	Do.			31 May & 1 June
Yellow Bullock,	30	41	31	4	24	15	28	2	Do.			8th June
Ditto, ..	30	25	31	15	25	3	28	2	Do.			..
Ditto, ..	29	18	25	0	19	16	28	2	Do.			..
Ditto, ..	29	34	17	8	13	16	28	1½	Do.			22nd to 24th June
White Globe, ..	30	37	31	19	25	6	20	1½	Do.			8th June
Pumplieburn, Wamphray,												
Swedes, ..	29	35	26	12	21	2	22	3	Do.			29th & 30th May
Yellow Bullock,	29	45	23	13	18	15	16	3	Do.			1st to 5th June
White Globe, ..	29	37	32	16	26	0		3	Do.			15th June
Green Top White,	29	40	39	8	31	4	14	2	Do.			10th June
Wamphraygate, Wamphray,												
Swedes, ..	30	41	24	10	19	8	25	2	Do.			30th May
Yellow Bullock,	30	46	22	9	17	16	20	2	Do.			26th June
Ditto, ..	28½	48	19	8	15	7	20	2	Patagonian			..
White Globe, ..	30	42	24	7	19	6	20	2	Do.			..
Broomhills, Wamphray,												
Swedes, ..	28	40	33	19	26	19	20	3	Peruvian			1st June
White Globe, ..	28	40	32	4	25	11	15	3	Do.			15th June
Poldean, Wamphray,												
Swedes, ..	30	42	23	7	18	10	30					3rd June
Yellow Bullock,	29½	38	19	19	15	16	25					
Woodhead, Moffat,												
Swedes, ..	28	36	27	17	22	1						
Yellow Bullock,	28	47	23	16	18	17						
White Globe, ..	27	41	29	19	23	15						
Green Top White,	28	42	24	3	19	3						
Woodfoot, Moffat,												
Swedes, ..	27	48	25	8	20	3	20	4	Do.			24th May
Yellow Bullock,	30	43	23	14	18	17	18	2	Do.			1st to 15th June
White Globe, ..	29	47	27	1	21	9	24	1½	Do.			
Craigbeck, Moffat,												
Swedes, ..	28	51	28	16	22	17	20	2	Do.			15th to 20th May
Yellow Bullock,	28½	46	26	18	21	7	20	2	Do.			1st to 15th June
Shaw, Hutton,												
Swedes, ..	28	28	35	0	27	15	30	2½	Do.			18th to 30th May
Yellow Bullock,	28	27	28	7	22	10	20	2½	Do.			1st week of June
Ditto, ..	28	31	23	16	19	0	25			4		..
Green Top White,	28	29	42	14	33	17	30	2½	Do.			19th May
White Globe, ..	28	26	35	11	28	3	25	2½	Do.			1st week of June
Boreland, Hutton,												
Swedes, ..	29	38	26	14	21	3	20	2	Do.			20th May
Yellow Bullock,	29	43	18	12	14	15	15	2	Do.			4th June
Gillesbie, Hutton,												
Swedes, ..	27	35	36	6	28	16	30					19th May
Hardy Green, ..	26	30	27	18	22	2	15	2	Do.			1st June

The weights were taken in different portions of each field, and those here stated show the average; the heaviest and lightest not being particularized.

The average weights of the whole fields are:—

	SCOTCH ACRE. Tons.	Cwt.		IMPERIAL ACRE. Tons.	Cwt.
For Swedes, ...	30	17	....	24	9
,, Yellow, ...	24	15	....	19	14
,, Common, ...	32	8	....	25	14

The following is the report by Messrs. Carruthers, Kirkhill; Graham, junior, Shaw; and Rogerson, of Boreland, Inspectors appointed by the Club:—

The inspectors were engaged the whole week, beginning the 4th November, in making the inspection. Their object was to take generally the crops of the members of the club in different parts of the district, and the table now submitted comprehends those of seventeen members, with a few others in their respective neighbourhoods most convenient for inspection; the whole, excepting five, being those of tenant farmers. A more general inspection over the district could not have been taken, without bestowing an inconvenient portion of time, or unless it had been entrusted to more than one committee. In almost every case two of the inspectors were present. From occasional absence of farmers and otherwise, the inspectors regret their table is not so complete, as to dates of sowing, as could be wished; but in regard to the quantities of manure, they believe it is nearly accurate, as, not only among the members of the club, whose notice has been drawn to the subject, but among farmers of the district generally, a greatly increased attention appears to have been given to rules and calculations in manuring. The inspectors, in submitting the following notices, beg to remark, that while stating the impressions made on them in the progress of the inspections, and by the result of them, they by no means venture to lay down positive rules of management, being aware that these must in all cases be contingent on, and modified so as to accord with, the varying weather of each season, as well as with the different soils and situations of each farm in the district.

GENERAL PRODUCE OF THE TURNIP CROP.

In 1849 it was stated that the average of the weighings represented a fair sample of the whole district, but this year the inspectors do not consider that it does so; because in the district generally, although the best managed, manured, and early sown crops are at least equal to those of last year, yet many fields on colder land were later sown, and these, as well as where weakly manured (especially without guano), are all inferior to last year. The inspectors would say, therefore, that the general produce of the district would be nearly correctly represented, were the average struck without including the five farms of heaviest produce, and it would then stand thus, per Scots acre:—

	Tons.	Cwts.
Swedes, ...	29	10
Yellow, ...	23	15
Common, ...	28	8

TIME OF SOWING.

This year shows still beyond last the great advantage of early sowing. In the case of swedes, the variation of time from 15th to 25th May seems not important; but, when sown any later, the probabilities of great weight decrease. In common white, red, and green, large crops are produced with sowing in the first and second weeks of June; after the 15th chances of weight diminish. But if any sort is to be deferred till after that date, the white globe is the kind best adapted for late sowing. The cases of very early sowing in May, at Broomhouses, Kirkburn, Shaw, and Dalfibble, have shown a superiority which, it was evident from the land and manure, had only been attained by extremely early sowing. The inspectors understood that most of these stood a large crop early in September. The sowing a portion of common turnips even before swedes in May, may therefore be very necessary on these farms, where it is important to have turnips for consumption in September. The condition of the land at the time of sowing being, however, at all times very important.

WIDTH OF DRILLING AND HOEING.

The width of drill varying from 26 to 29 inches, according to the condition and quality of the land, seems to be generally adopted, and even for the greatest crops no greater width is necessary.

The precedent of Mr. Elliot's thin hoeing of last year attracted general attention; and it will be observed that on six or eight farms, where the greatest produce is shown, the turnips are all at 11 to 13 or 14 inches apart, while in most of the smaller crops they are only at 7 or 8 inches; and where experiments have been tried in the same field, the weight is greatly in favour of thin hoeing, as far at least as 13 or 14 inches. It is only therefore in the case of poor land, late sowing, or weak manuring, that the inspectors would hesitate to adopt the thin hoeing; in these exceptional cases alluded to, they have yet to see more experiments made, and seasons of different character; and they may remark that the advantage of thin hoeing has been more decidedly proved to them in regard to swedes and white turnips than in the case of yellow-bullock, of which there have not been shown many examples of thin hoeing to compare with the ordinary mode.

VARIETIES OF TURNIP AND SEED.

In the course of their examination of fields, the inspectors have been much impressed with the superiority in the selection of more pure and regularly grown sorts of seed, and a considerable difference in weight undoubtedly arises from this circumstance.

Among the swedes, Skirving's purple-topped; and of the yellow, the purple-topped, become the largest of their sorts. But various farmers had given up their culture from their being more easily destroyed by frost than the others of their respective kinds. Now, however, that it is becoming more generally the system to secure the crops against frost by early taking up, this objection should only weigh in partial cases; as to the respective proportions in which swedes, yellow, and white should be cultivated, the inspectors may observe that they saw many cases of late sowing, or poor manuring, where they have no doubt the white should have been adopted in place of the yellow; on the whole, they are inclined to think that now that calculation in consumption is more generally attended to, the extent of yellow will be decreased in favour of swedes and white.

MANURE.

In comparing the results of the different sorts of manuring in this and last year, it appears that the farm-yard manure, when applied alone, has had less effect in 1850 than in 1849, and that to raise good crops, extra manure in considerable quantities was necessary, showing that in different seasons the relative effects of manure vary. The regularly great crops over extensive fields of 30 or 40 acres each, raised on Hardgrave, show the good results of a variety of manures applied together, with even only a limited portion of farm-yard manure. The benefit of the application of a mixture and variety of manures at once is also exemplified at Prestonhouse, and in the few other cases wherever tried. The extraordinary produce of very extensive fields also at Dalfibble, prove more the advantage of previous very high condition on soil of superior quality, and of early sowing and general perfect culture, than of any peculiarity in the kinds and quantities of manure. Dissolved bones may, it would appear, be generally used as a substitute for guano at the present relative prices; and Peruvian guano, to the extent at least of 3 cwts. per Scots acre, may always be profitably used in addition to 20 yards of dung. Some especial cases show the great inferiority of Patagonian to Peruvian guano. While, however, many cases show that good crops of turnips can be raised with guano and dissolved bones, the inspectors beg to remark that in regard to many of the arable farms of the district, ground bones should constitute a considerable portion of the extra manure purchased, as being more permanent in their effects. But above all, the greatest attention should be paid to the increase of farm-yard manure, as being most essential to permanent fertility, more especially to the maintaining of good pasture grass in the rotation.

On this head generally the inspectors remark that to the farmers of the district, knowing the soil and character of the different farms, the table will furnish more accurate ideas of the comparative value of the different manures, than can be otherwise conveyed to strangers to the district.

The elevation above the sea of nearly all the farms varies from 200 to 300 feet; the exceptions of Kirkhill and Gillisbie, above 500 feet, show, from the large crops raised there, that any disadvantage of climate has been compensated by early sowing.

In conclusion, the inspectors beg to suggest that these annual examinations, and publications of the result among the members of the club, should be continued; trusting that a greater number of experiments will in future be made and reported; and they may also observe that were such inspections to become general in other districts of the country, it would necessarily tend to a general diffusion of the knowledge of the best practices of culture and their results, and consequently to a rapidly increasing improvement in the cultivation of this important crop.

MARKET GARDENING ROUND LONDON.

GENERAL REMARKS TOUCHING ROTATION OF CROPS, &C.

If we take a five-acre piece of ground, say in Nov., we shall find it full of cabbages, which having been planted out about the 25th of October, will be strong healthy plants. The moment these are off, the land is again trenched and cropped with early celery, in well dunged trenches six feet apart, with two or three rows of lettuces or coleworts in the middle; for market gardeners do not mould up celery until it is very large (often 18 inches high), so there is plenty of time for a crop of cabbages, coleworts, or lettuces, to come to maturity. When the celery is removed, the ground is cropped with winter greens, and again cleared off, for nothing pays so well as the London greens or young unhearted cabbages. In November Mr. Fitch, of Fulham, has often upwards of 20 acres of these, besides 26 acres of cabbages: every hole and corner under trees, and all spare places being full. When the five-acre piece is cleared of coleworts, say by the 1st of March, it is again dunged and trenched, and sown with onions, and very often lettuces are planted in the beds as well as in the alleys. When the onions are off, the ground is trenched and planted with cabbages or coleworts, &c.; next spring a crop of cauliflowers, gherkin cucumbers, French beans, or scarlet runners, is taken off; but the grand point in the course of rotation is to be continually sowing, and whatever plants are ready when the ground is empty to plant these. The land can well sustain so much cropping on account of the heavy dungings, trenchings, and hoeings, which it receives. If you ask a market gardener what is to succeed this or that crop, the answer is, "Don't know: it depends upon what is ready for planting." Continued trenching two spades deep for any crop seems expensive; but a strong Irish labourer will turn over from 12 to 14 rods a-day, with comparative ease; and I may here state that if it were not for the Irish labourer, the prices of vegetables would be much higher. Market gardeners know that after an active crop the top soil for several inches deep is entirely exhausted, and hence the reason for continual trenching, in order to bring up the top soil, that but a few months before had been turned down, with a large proportion of dung, to enrich it and fit it for active use along with the half-decayed manure.

Market gardening is well conducted about London; and if young gardeners were to spend only one year with such men as Messrs. Fitch, of Fulham, it would teach them a lesson which would amply repay a twelve-month's hard labour. They would there be taught how to grow digestible vegetables, and not those stunted blue cabbages, and other things that are, in too many cases, huddled up in walled-in gardens. I am almost certain that the day will arrive when the latter will be converted into forcing grounds, and when vegetables will be grown in the open fields, which are their proper places. If a farmer were to send his son to be a labourer in a market garden for a year or two, the value of such a school to such a man in after life would be great to himself, his landlord, and to the country at large. The expensive system of a market garden would not be required in a farm; it could not be maintained; but it would show him that one acre cultivated by the spade is equal to five by the plough. We know that some market gardeners use the plough, but how does it pay? Their things are always the last sold, and that for the most part to the hawker, whose name will tell the price obtained. It is, however, necessary to have a scarifier plough in all market gardens, in order to tear up the earth after the carts in wet weather.

Some years ago I took the late Mr. Smith, of Deanston, over Messrs. Fitch's grounds. Till then he had no knowledge of the enormous expenses of keeping a large garden. "I have not seen," said he, "on the whole 150 acres, a weed; all the ground exhibits a fine level surface; every inch is cropped; all the paths regular; the cart roads in good order; the hedges of the boundaries very dwarf; no ditches, and all the large plantations of apples, pears, and plums, amounting to 50 acres, with every young shoot made during the summer, pruned down to a couple or three buds from last year's wood." Pruned after the manner of currant bushes, they look well, and bear enormous crops. The ground under the trees is all cropped with rhubarb, currants, gooseberries; and during the winter with coleworts and cabbages. I have seen eight acres of cabbages in seed beds, after the rest are all picked out for spring cabbages. Every spare piece of ground is filled; when the asparagus haulm is cut down, the ground is forked over, and all planted with coleworts, alleys and all; and when the rhubarb leaves die down, this ground is also filled, so that altogether, besides the other crops, there must be several hundred thousand heads of greens for winter market. All liquid manure from dunghills is collected into a large tank; this is conveyed to, and distributed over the ground before digging; but the great objection to the use of sewage water after the crop is in, is that it fills up the pores of the earth, cements the mould, and prevents heat and air from acting on the roots.

Some market gardeners keep large herds of pigs, which live night and day amongst the hot dung, and subsist upon the corn that they pick out of the straw and dung, as well as on green food. Mr. Fitch keeps 12 horses, whose whole employment is to cart goods to the various markets, bring home dung, and convey it to vacant pieces of ground, which occur every week. The carts and waggons in use in market gardens have generally broad wheels. The waggons are very large, and the carts will hold as much as a Suffolk waggon. The labourers employed by Messrs. Fitch on 150 acres amount to about 70 during winter, and in summer to about 150. The rent per acre is from £9 to £10, the tithes being from 10s. to 12s. per acre. Men's wages are 2s. per day; women, from 1s. to 1s. 6d. Some idea of the amount of labour in small matters will be conceived, when I state that the whole of the frames, amounting to 1,000 lights, are all painted and repaired every autumn. The whole of the hand lights, 4,000 in number, are also repaired; and every description of vegetable is washed before it is sent to market. When men are at piece-work, they receive 2½d. per rod for trenching two spades deep; thus an acre highly manured, using cart-loads instead of barrowfuls, and trenching with spade, instead of shallow digging, or what is worse, using a plough, pays just in proportion to the way in which it is treated.

I have now thrown out a few general hints as to the management of a 150-acre garden. In my next and following articles I shall proceed to particularise some of the leading crops.

Camberwell, JAMES CUTHILL.

DENMARK.—No. V.—ITS CORN TRADE.

(FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.)

Barley is the grand article in the corn exports of Denmark, but those of wheat are far from insignificant. Last year we received from the Danish ports the immense amount of 1,320,571 quarters of grain and meal—viz., 243,213 quarters of wheat and flour, 671,665 of barley and barley-meal, 253,213 of oats and oat-meal, 78,292 of rye and rye-meal, 62,196 of peas and pea-meal, 9,879 of beans and bean-meal, besides some trifling quantities of other sorts; a larger amount than we received from the immense empire of Russia (which sent us but 920,000 quarters), from France, Holland, or Belgium, or, indeed, from any country except the United States and Prussia. Our imports from Denmark have increased enormously within the last ten years, especially since the change in the Corn-laws. In 1845 we received from that country 364,000 quarters of grain and meal of all sorts; in 1847, 688,054 quarters. These numbers include the exports from the Duchies; but it is remarkable that in 1848 we imported from Denmark Proper alone 893,519 quarters of grain and meal, being over 200,000 more than we received in the previous year from the Kingdom and the Duchies together. The quantity sent in the form of meal is trifling, not exceeding a few hundred or thousand quarters. The exports to England have generally made about 33 per cent. of the whole corn exports of Denmark, but in 1848 they amounted to nearly 70 per cent. of the total amount from the Kingdom alone. In order that the reader may have a clear idea of the amount of the corn trade in late years, I give the following table of exports, though some of the quantities have already been mentioned. Let it be borne in mind that the tables represent the net exports, or the surplus of exports over imports, deducting the latter, which average 40,000 qrs. yearly—and that the last year, 1848, gives the exports from Denmark Proper only.

	Wheat.	Rye.	Barley & Malt.	Oats.	Peas.	Buck-wheat.	Totals.
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.
1844	133,509	193,134	646,316	107,732	30,159	53	1,110,994
1845	198,583	172,517	517,176	141,211	101,966	11,617	1,243,070
1846	181,461	176,622	649,485	216,352	86,642	40,252	1,350,820
1847	221,061	202,096	583,244	368,189	92,597	58,244	1,554,140
1848	113,998	214,962	784,532	207,938	97,730	2,270	1,341,431

The particular exports of the Duchies were—for 1844, 330,000 qrs.; for 1845, 310,000 qrs.; for 1846, 210,000 qrs.; and for 1847, 579,000 qrs.*

It is a mistake to suppose that a very large proportion of the corn of Denmark is exported from Copenhagen, though the capital is of course the chief place of business for the corn trade generally. The export of grain and meal from Copenhagen alone amounted only to 58,300 qrs. in 1847, and to 49,000 qrs. in 1848. The warehouses of Copenhagen can, indeed, provide accommodation for a considerable quantity of corn, but it is found much more convenient and economical to ship the grain from the various small ports with which the Danish isles and the coasts of Jutland abound; and indeed there are many considerable estates on the coast from which the corn is exported directly, either on the owner's account, or that of the merchant. They are provided with a place of shipment, selected at some convenient spot of an adjacent creek or inlet, where the corn can at once be transferred from the owner's store-houses to the hold of the ship. The numerous little seaports of Denmark—each with its harbour, wharves, and lighthouse—afford a pleasant scene of activity and business and form a very interesting feature in the appearance of the country. The following is a list of the chief of these, with the number of vessels and the tonnage belonging to each:—

	Vessels.	Tonnage.
In Zealand :—		
Drago	61	11,000
Elsinore	17	2,500
Holbeck	7	1,500
Kallundborg	18	3,000
Kioge	9	800
Corsoer	27	8,740
Nestoed	11	2,400
Nykjœbing	23	3,500
Præsto	10	2,500
Vœrdingborg	9	870
In Samsœ :—		
Samsœ	12	1,170
In Falster :—		
Nykjœbing	13	1,870
Stubbekiœbing	20	5,000
In Lolland :—		
Bandholm	26	3,820
Nakskov	36	4,570
Nysted	6	610
Rodby	2	80
Saxkjœbing	3	375
In Moen :—		
Stege	27	4,320
In Bornholm :—		
Nexoe	13	2,470
Ronne	50	1,050
Svannike	29	2,890
In Langeland :—		
Radkjœbing	46	8,300
In Fyen :—		
Assens	54	6,100
Bogense	13	2,110

	Vessels.	Tonnage.
In Fyen :—		
Faaborg	51	8,650
Kjerteminde	42	3,550
Niddelfart	11	100
Nyborg	76	9,800
Odense	45	8,500
Svendborg	193	4,700
In Jutland :—		
Aalborg	75	2,100
Aarhuus	53	1,000
Anholt	8	940
Ebeltoft	2	50
Fanœ	126	2,200
Fredericia	16	1,640
Fredericks-haven	30	3,600
Grenaa	10	860
Hjerting	12	960
Hjœrring	21	1,700
Hobro	4	480
Holtstebro	8	1,400
Horsers	34	6,650
Kolding	6	950
Lœsœ	29	610
Lemvig	10	1,900
Lœgstœr	15	1,710
Nibe	13	1,250
Nykjœbing	23	2,030
Randers	27	7,970
Ringkjœbing	19	2,280
Skagen	9	380
Thisted	39	3,780
Veile	21	3,710

The ports which, after Copenhagen, have the largest corn export, are Kallundborg, from which the quantity shipped is estimated at 40,000 qrs. annually; Aarhuus, about the same; Holbeck, 35,000 qrs.; Odense, 45,000 qrs.; Nakskov (in Lolland), 60,000 qrs., of which about 50,000 are wheat; Nestoed, 55,000 qrs.; Horsers, 30,000 qrs.; Faaborg, 28,000 qrs.; Randers, 25,000 qrs.; Aalborg, 30,000 qrs.; Bandholm, 60,000 qrs. The latter port has doubled its exports within a few years, and owes its present flourishing condition to the liberality of Count Knath, of Knathenborg, in improving the harbour and erecting an export wharf. Its exports, like those of Nakskov, are chiefly wheat.

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* The value of the whole corn-exports of Denmark Proper and the Duchies in 1847, was estimated at 13,058,144 rix-dollars, or £1,612,000 sterling — the value of the whole exports of all kinds being 30,850,000 rix-dollars, or about £3,800,000 sterling. Those of Denmark Proper alone in 1848, were 10,260,000 rix-dollars, or £1,280,000 sterling.

The production of 1847, which was rather over the average yield of the harvest, has been estimated at 270,000 qrs. of wheat, 1,566,000 qrs. of rye, 1,585,000 of barley, 1,916,000 of oats, 331,000 of peas and vetches, 66,000 of buck-wheat, 50,000 of rape. This calculation applies only to Denmark Proper, and being taken from official documents, may be regarded as nearly correct. Comparing the amount of the exports for the same year, it appears that four-fifths of the wheat, more than one-third of the barley, nearly one-fifth of the oats, but not one-seventh of the rye, was exported to foreign countries. Rye is the staple article of food in Denmark, and is of nearly the same relative importance for the sustenance of the labouring class as potatoes are in the British islands. The annual consumption of corn of each individual in Denmark Proper has been estimated at 311 lbs. Danish, or 350 lbs. English.

The production of corn in the Duchies of Schleswig and Holstein, for the year 1847 (the harvest being rather above the average), has been calculated at 316,500 qrs. of wheat (234,000 in Holstein, and 97,500 in Schleswig), 704,500 qrs. of rye, 1,057,000 qrs. of barley, and 2,569,000 qrs. of oats.

The average price (*kapitelstaxt*) of grain is fixed every year in each province of Denmark by the bishop and prefect. I was favoured with the following communication from Messrs. Puggaard and Co., who are amongst the most eminent brokers of Copenhagen, as to the price of grain during the past year, and the export to England.

"Prices of grain have been low in this year, being, in the months of January, February, and March, about—

27s. 0d. to 30s. 0d.	per qr.	wheat,	free on board.
14s. 6d. to 16s. 0d.	„	heavy barley,	ditto.
13s. 6d. to 14s. 6d.	„	small barley,	ditto.
11s. 0d. to 12s. 6d.	„	oats,	ditto.
17s. 0d. to 18s. 0d.	„	rye,	ditto.

"From April to June, including both, prices were—

27s. 0d. to 30s. 0d.	per qr.	wheat,	free on board.
14s. 0d. to 15s. 0d.	„	heavy barley,	ditto.
13s. 0d. to 14s. 0d.	„	small barley,	ditto.
12s. 6d. to 13s. 6d.	,,	oats,	ditto.
16s. 6d. to 17s. 6d.	„	rye,	ditto.

"In July, August, and September—

30s. 0d. to 33s. 0d.	per qr.	wheat,	free on board.
15s. 0d. to 18s. 0d.	„	heavy barley,	ditto.
14s. 0d. to 16s. 0d.	„	small barley,	ditto.
14s. 0d. to 15s. 0d.	„	oats,	ditto.
18s. 0d. to 19s. 0d.	„	rye,	ditto.

"The cost of carrying grain to market in England varies from 4s. to 8s. per qr.; in which calculation is included freight, insurance, duty, metage, and commission in England, the difference arising chiefly from the various rates of freight to be paid at different seasons. Last summer the freight for wheat (other grain in the usual proportion thereto) was thus 2s. in full per qr., and in winter it will vary from 4s. to 5s. per qr.; we have known it as high as 8s., in which case the charges, of course, amount to 11s. to 12s. per qr."

It will have been seen from the above statement that oats form the largest article of corn produce in Denmark, and that barley constitutes the bulk of the exports.

I found that the large increase of the export of corn in 1849 was attributed by the best judges to the rapid improvements that are taking place in cultivation, as well as to the increased facilities of communication and access to the best foreign markets which every year brings about. The harvest of 1849 is calculated to have been considerably above the average, but it could have affected the exports of Denmark only in the last three months of the year. The blockade of the German ports, in 1848 and 1849, by the Danish navy, had no effect in changing the course of the Baltic corn-trade, or causing any increase of the imports of corn into Denmark. There prevails now, in Denmark, the strongest possible desire amongst both the agricultural and the commercial classes of the inhabitants to emancipate themselves from the tyranny which the Hanse Towns have so long exercised over their trading relations, and to draw closer the bonds of direct intercourse with England. Hitherto Denmark has received the largest portion of her supplies of manufactured goods through Hamburg, and the Danes are anxious that this should no longer be the case. The Schleswig-Holstein war, amongst its other consequences, has had considerable effect already in breaking up this monopoly. In 1847 I find that the value of goods imported direct from Hamburg into Denmark Proper was 2,001,163 rix dollars (£222,000), and from Hamburg, by transit through Kiel, 4,156,096 rix dollars (£450,500). In 1848 the value of goods imported direct from Hamburg was only 701,783 rix dillars (£77,950), and that of goods imported by Kiel, 653,829 rix dollars, or £72,640. The possibility of doubling the export of corn in ten years is looked forward to; and though estimates of this sort can be little better than conjectures, the anticipation is probably not an extravagant one. The production of Denmark is now calculated to be 1,800,000 or 2,000,000 qrs. more annually than it was at the commencement of the present century. I have shown that though vast improvements in agriculture have taken place, many remain to be effected, and there can be little doubt that the energy and perseverance which are pre-eminent characteristics of the Danish people will not allow them to pause in the career of amelioration until practical skill and science shall have enabled them to accomplish these.

Denmark holds the keys of the Sound, and the corn-laden fleets which annually ply between the various countries of the Baltic and the shores of England pass through Danish waters. It is not a little curious to observe what a preponderating share of the great movement of navigation witnessed in the straits of these northern seas is called forth by this branch of commerce. Wishing to obtain authentic information on this interesting subject, I proceeded to Elsinore, the capital of the Sound, and the central point of northern navigation. It is a spot inseparably connected with the poetry of northern life, yet it is scarcely more hallowed to fancy by the associations with which the genius of

Shakspeare has surrounded it, than it is important from its intimate connection with the interests of our own busy age. A narrow channel, hardly more than three miles across, here separates the sister-lands of Scandinavia—Denmark and Sweden. Even independently of all the charms with which memory and reflection invest it, there are few scenes which raise so perfect a feeling of beauty in the mind of the spectator. The Sound teems with vessels under sail or at anchor, displaying the flags of all nations, and riding on waters that may vie in hue with those of the Mediterranean itself. The richly-wooded shores of Zealand are green and blooming under a bright sun, and contrast finely with the sterner outline of the rugged granite crags (crowned, however, with farm-houses and corn-fields) of the Swedish coast, beneath which lies the town of Helsingborg, with its square white tower. Elsinore, with its harbour, mole, and lighthouse, is finely situated on a projecting ridge, forming the north-eastern extremity of Zealand. At the furthest point stands Cronborg Castle, one of the strongest fortresses in Europe, and also one of the most superb specimens of the palatial architecture of the middle ages, constructed by the skill of Tycho Brahe on the ruins of Hamlet's Castle of Flynderberg. The Naiad, a gallant corvette, lying outside, is the guard-ship of the Straits; and pilot-boats from the haven, manned by sailors who are the Deal boatmen of the Northern Seas, flit round the ship like bees about flowers. The wind which speeds one vessel on her voyage retards another; and such is the press of shipping collected at times on either side of the cape, that 450 vessels have passed Elsinore, and been cleared at the custom-house, in a single day.

The number of vessels that have passed through the Sound during each of the last five years—or rather the number of voyages annually made by Baltic traders—as shown by the archives of the Sound toll, is about 20,000, and nearly one-tenth of these are to be set down to the account of the British corn trade. In 1849, I ascertained that 1,270 British and 637 foreign ships passed the Sound, with cargoes of corn to England. Besides these, 130 British and 590 foreign corn-laden vessels (the latter, it may be presumed, almost exclusively Danish) passed the Belts. The entire number of vessels and cargoes from the Baltic to Great Britain and Ireland, in 1849, was 5,007, of which 3,472 were British, and 1,535 foreign. The entire number of vessels and cargoes from Great Britain and Ireland to the Baltic in the same year was 4,830, of which 3,288 were British, and 1,542 foreign. During the present year there are the best grounds for expecting that the number will be still larger, as the bulk of the Baltic trade is carried on in the summer and autumn months, and the returns up to September show a considerable increase. I may add, in conclusion, that the Sound dues yield a revenue of £240,000 annually to Denmark, being an average of £12 on each cargo.

PROGRESS OF AGRICULTURAL KNOWLEDGE.

The progress of agriculture is necessarily slow. Not only has every experiment to be from nine to twelve months in being developed: every one is enveloped in a long series of modifying circumstances, affected by the differing influences of climate, and especially the varying effects of one or a series of wet or dry seasons; the almost countless difference in the character of soils partly depending on their mechanical construction, partly on their chemical composition, and partly on the geological substratum on which they rest: then, again, the character of the manure applied, or existing unexhausted in the soil; so that to obtain a foundation for the test it is necessary to exhaust the artificial fertility of the soils before the natural productiveness of the soil can operate, and before an entire field can be in a state fit for the development of its testing qualities. All these, with the trouble and *cost* of making these experiments, tend very materially to increase the expense and labour of making those experiments on a satisfactory basis, which are absolutely necessary to the proper understanding of the bearing of the many facts and principles in farming.

Mr. Pusey, in his recent article in the last number of the *Royal Agricultural Society's Journal*,* "On the Progress of Agricultural Knowledge during the last eight years," well describes the difference between a review of progress in such a society, and that of the other mineralogical, botanical, entomological &c. "Other societies," he says, "deal chiefly either with facts, as the existence of some hitherto unknown insect, bird, or mineral, or even planet, or else some supposed new law of nature, electrical or astronomical. These facts are simple, those laws single. If the speculator fall into error, no harm ensues. But not so in agriculture. Our facts are not simple, nor our laws single."

It is not our intention to review the paper of Mr. Pusey, but an allusion to the main facts he adduces will be both interesting and instructive. And first he properly places the cooking of bones by dissolving them in sulphuric acid; and this he takes credit to science for, and this alone will certainly pay for all the cost of all our Societies. He guards, however, the reader against adopting all the scientific dicta of any man, how great soever he may be; and alludes to the failure of the mere mineral elements, which is also a negative fact, equally proved by the investigations of agricultural science. As to manures, he well says—"At present, however, we can only say that the three principles of manure are—

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* "The Journal of the Royal Agricultural Society of England," vol. ii., part 2, No. 26. London: Murray.

1. Ammonia,
2. Phosphorus, and probably
3. Carbon."

After a passing allusion to the power of clay to detain ammonia, and its bearings on the management of manure, he goes on to the principles of organic nutrition: and to show that comfort is a necessary adjunct to the fattening of cattle, and gives a somewhat interesting review of the warring chemists, Liebig and Boussingault, as to the effects of nitrogenous and non-nitrogenous food, without, however, giving any very decided opinion.

On meteorology he has many interesting remarks; and this is not the least interesting—that one side of this island is more suited for corn and the other for herbage; and concludes with some wholesome cautions against laying down any general rules. Passing over his observations on farm implements, we come next to the vexed question of draining. Mr. Pusey's opinions—and we believe him to be a candid and unprejudiced writer—are well known to our readers. He has given up the very deep pipe and distant drain system, as one suited for all soils; and this is much safer than any idle theory of one uniform depth and distance on all descriptions. He gives, however, a new test for distance, which we are by no means disposed to undervalue. He says—"The breadth of the ridges is a good guide to the right interval between the drains, for our forefathers shaped them to the quality of the soil." On the subject of over-draining grass land, Mr. Pusey also speaks out in a way which may offend some mere theorists, but his remarks will have proper weight with sound practical men. Not only has grass land been over-drained, but so manifest and palpable is the difference, as, against the system, that the tenants have had to stop every other drain; and Mr. Pusey himself adopts the plan of damming the streams in summer: this causes the water to flow up the drains, and rises in the soil by a sort of capillary attraction, and this he properly describes as a mode of sub-irrigation which has been attended with the most beneficial results.

The application of burnt clay to stiff soils is also alluded to in a very judicious manner. Facts are adhered to, and one given is exceedingly striking:—On a field valued at 7s. 6d. per acre, the clod burning was adopted at a cost of 42s. A crop of vetches were sold off—a scouring crop, it must be admitted. A crop of 45 bushels of wheat per acre was obtained, which sold for 7s. 5d. per bushel, and produced more than the fee simple of the land.

On the claying of light sandy or peat soils the paper is equally explicit and clear; and after stating the cost of the process on the latter soils at 54s. per acre, he gives the produce of the land before the operation at £12 9s., and after, at £20 3s. 6d., showing a clear profit in three years of £7 13s. 6d., or upwards of £1 10s. per acre per annum.

We have not space now to go further into the merits of the paper, but would like to do so in an early article.

Suffice it to say that it is a most judicious, sensible, and valuable article. — Gardeners' and Farmers' Journal.

STATE OF THE AGRICULTURAL INTEREST.

PUBLIC MEETING AT HARLESTON.

A public meeting was held at the Corn Exchange, Harleston, a few weeks since, at the instance of several tenant-farmers in the district, "for the purpose of making known and discussing the ruinous state of the farming interest, and for adopting petitions to Parliament, or a memorial to the Executive Government, demanding inquiry or remedial measures."

The meeting was called for twelve o'clock, but a delay of an hour and a half took place, in expectation of the arrival of Mr. Wodehouse, one of the members for the eastern division of the county of Norfolk. That gentleman, however, did not make his appearance.

Thomas Lambe Taylor, Esq., of Starston, was moved into the chair.

The meeting numbered about 250 persons, including all the principal tenant-farmers in the locality, amongst whom were Messrs. G. F. Pretty, W. Johnson, R. Clarke, J. Ebden, J. Spelman, H. Parker, C. Etheridge, R. Moore, J. B. Pratt, S. Algar, W. W. Elliott, S. J. Leftly, T. Green, W. Cudden, R. D. French, F. W. Pretty, J. Hall, E. Kersey, C. B. Johnson, W. Bate, A. Parker, J. Beaumont, R. Bacon, J. Paul, R. M. Drake, J. F. Parrington, W. Chambers, C. Drake, F. Chambers, N. Parker, J. Davey, R. Read, W. L. B. Fruer, F. Dix, R. Bond, J. Bond, G. Barnes, F. W. Hunter, W. Cann, J. Lear, W. B. Elliott, W. Hazard, G. Carthew, S. G. Gilbert, J. Wake, J. Sims, F. H. Denny, B. J. Crisp, S. Westgate, L. B. Hudson, R. Gowing,

J. Bentfield, J. B. Allsop, W. Redgrave, S. Rackham, J. Fisher, H. Smith, J. Ringer, J. Howlett, J. Booty, B. Bond, &c.

The CHAIRMAN opened the meeting by stating the object for which it had been convened. It might be thought he was not a qualified person to occupy the chair, having, as they would remember, on a former occasion, presided at a free-trade meeting in that town. Though still favourable to free trade, he wished to remind them that, while advocating the repeal of the corn laws, he had, at the same time, urged the reduction of taxation (Hear, hear), and had pointed out the effects of the currency laws, which he then considered, and still considered, produced more effect on the price, not only of corn and meat, but of every kind of raw produce, than the corn laws had ever done. (Hear, hear.) Many of them attended a preliminary meeting, held a fortnight ago, for the purpose of making arrangements for the present meeting, and certain resolutions were then assented to, as proper to be proposed for adoption on this occasion, though it was understood that no one was to be considered to be in any way pledged to these resolutions. He would at once read them, previously observing that it was open to any gentleman to move an amendment:—

"That the occupiers of the land have, for some time past, been unable to sell their corn, meat, and other farm produce at prices anything like equal to the cost of their production, and, consequently, they are unable to meet the demands upon them for rent, tithe-rent, rates, and other stated outgoings, and are involved in such pecuniary difficulties that their ruin seems inevitable, unless their outgoings are materially reduced, or the prices of farm produce greatly advance, which does not seem probable under existing circumstances.

"That this meeting is of opinion that various causes have tended to bring about the existing state of things, and it hopes that Parliament will, on its assembling, institute an immediate, full, and impartial inquiry into the ruinous situation of the occupiers of the land, and ascertain the causes of distress which is overwhelming the landing interest, and seriously affecting all classes directly and indirectly connected with it. And this meeting urges that the inquiry should not only extend to the effects produced by the importation of foreign corn, cattle, and meat, consequent on the repeal of the corn, and other restrictive importation laws, and the operation of the tithe-commutation law, and particularly as to the corn averages, regulating the tithe-rent, extending over so many years—which renders a high tithe-rent payable when farm produce is selling at most reduced and ruinously low prices—but this meeting particularly urges that the inquiry should comprehend an examination into the effects on prices not only of agricultural produce, but on prices generally, from the operation of the several laws termed the Monetary or Currency Laws, and more especially those fixing the mint price of gold, and limiting the bank-note circulation.

"And this meeting strongly desires to call the attention of Parliament to the strict equity of taking measures for further materially reducing the interest of the National Debt, looking at the present low, in comparison with former high, prices of produce, and the rate of wages out of which the interest is raised by direct and indirect taxation; and the necessity there is for reducing the over-large and over-paid military, naval, and civil establishments of the country, so that a corresponding diminution may be effected in the taxation of the country, and more especially of the malt, hop, and other taxes on British produce, which press most severely on the farmer and the working-classes.

"That a petition to the House of Commons, grounded on the above resolutions, be adopted, and that the members for this division of the county be requested to present and support the same, and inform and instruct the Executive Government as to the actual and critical situation of the occupiers of the land, and those connected with it."

With their permission, having been requested to do so, he would now enter at length into his views of the unfortunate position of the occupiers of land, of which, he thought, those unconnected with farming had little conception. Time and events had not materially altered the opinions he held as to the justice and policy of repealing the corn laws, but he still maintained that other concurrent measures were necessary to complete that of free trade. He need not ask them whether the agricultural interest was in peculiar difficulty and distress. Did they admit this? (Yes, yes.) He stated the other evening that he believed, with the present prices of corn and meat, the farmers' income from the produce of the land would not, after their outgoings were paid, admit of the payment of any rent. (Hear, hear.) He found a general assent to that statement then, and he asked now whether the statement was correct? (Quite.) Now he held that their statement was not only *now* ruinous, but within the last thirty years had never been, for five consecutive years, healthy and satisfactory, or so thriving and prosperous as had been represented by those unconnected with and ignorant of farming. Some persons might urge that the farmers were not, as a class, entitled to relief at the expense of any other interest. He would grant it. Class legislation, he trusted, was at an end. He had never advocated it, and he wished to state, in the outset, that he, for one, would not thank Parliament for anything in the shape of bounties or protection, by means of corn laws or corn duties, as it was absurd—it was impious, in any human power to attempt to control, regulate, and artificially keep up the price of corn or food, and leave everything else to find its natural value. He desired the depression of none, but the elevation of all (applause). All the corn laws on the average of years had invariably and signally failed in realizing the prices which the promoters of these laws fancied they would secure. It should be borne in mind that we had had no less than 24 corn-law enactments between 1660 and 1828, or about one in every seven years, a frequency of legislation which alone tended to prove that the working of the preceding law was not satisfactory. And it should be borne in mind that these laws were, at the same time, injuring the manufacturing interests as well as deceiving the farming interest; indeed, one interest could hardly be injured without the other feeling it in the end. If Parliament were to-morrow to enact that henceforth wheat should not be sold for less than 30s. a-coomb, did they imagine that it could be sold at that price? Such an enactment would be as inoperative as the proposition of a former Chancellor of the Exchequer, that Parliament should enact that a £1 note and 1s. should be equal in value to a guinea, when the latter was selling for 27s. The old corn laws were used by landlords as an argument for keeping up rents, and tenants had never succeeded in getting rents lowered to their natural value, by which he meant the fair proportion of the produce of the land at market value, because they had placed too much reliance on those laws. It was necessary to state clearly what rent was. Mr. Malthus defined it correctly, and it would be well if those land agents and others who had the fixing and valuing of rents, would bear it in mind. Mr. Malthus said, "It is that portion of the value of the produce which remains to the owner of the land after all the outgoings belonging to its cultivation, of whatever kind, have been paid, including interest of the capital employed, estimated according to the usual and ordinary rate of the profits of capital at the time being." The farmers had never gone properly to work in hiring their farms; they had been too ready to give what their predecessors had given as rent, and even more, and rarely calculated the value of the land according to its productive quality. They ought to estimate the amount of rent in corn, instead of money, and say, "Out of this land I can afford for rent 2, 3, or 4 bushels of wheat per acre," or a proportionate number of bushels of wheat and of barley per acre, and then pay as rent the value of such wheat or barley, according to the average price of them at market; not on a seven years' average, as with regard to the tithe rent, but one extending over a shorter period, say two years. Ah! but some of them might say, the tithe corn-rent had worked badly for them. He granted it; but the principle of the long average was perhaps not so much the cause of the ill working of the laws as the commutation being based on a tithe composition much too high at the time the change was effected. He thought it would be easy to show that twenty years ago they were not only paying too high rents for hire of the land, but they gave too high tithe compositions, rather than cast the tithes, and bring upon themselves the unpleasantness and loss attending it. They were now paying, and whilst the present tithe law remained in force, whatever the average might be, would continue to pay tithe rent with reference to the value of the tithe composition fixed under the old corn laws. It must be allowed that the tithe commutation was a good measure, so far as it relieved both the tithe owner and farmer from the unpleasantness and difficulty of having to compound and agree for the tithes, and setting the farmer at liberty as regarded his mode of cultivation, it no longer being necessary to consider whether this or that treatment of the land would be ground for increasing the tithe composition. But he could not help observing, and as he was a titheowner he felt the more at liberty to make the remark, that the improvements in cultivation of the land, from the outlay of increased capital and skill, had been taken too much advantage of by those interested in tithes (he granted the law sanctioned it), and had tended to more than double, nay, treble the tithes, estimating them according to the natural productive quality of soil and the old system of farming. From 1561 to 1601, wheat averaged more than 47s. per qr. higher than at present, and tithes were then 2s. to 2s. 6d. per acre. Only yesterday an old occupier told him that he now paid £14 tithe rent for his farm, and that he formerly paid only five guineas, so that they had here proof that tithe had nearly trebled within the life of man. The fact could not be denied that the titheowners came in for a share of the profits of the tenant's capital. Where rents had been doubled, tithes had been trebled. For these reasons he thought they would agree with him that tithe rents should be reset on more correct principles. But he must leave the subject of the tithes for others to pursue. Before touching on the tithes, he had been reminding them, that in hiring their farms they must make better calculations as to the rent they could afford to give, and it would be as well, unless landlords would come forward and demand a revision of the tithe law, that they should hire tithe free. It was a matter they as tenants ought not to have anything to do with—they too readily paid what landlords had agreed to pay, and fixed themselves with their burdens. The farmer was told by some that he must look for his remuneration to the more successful cultivation of the land, and endeavour to grow a greater quantity of corn per acre. This was the advice of many landlords in districts where draining and other improved modes of farming, till within a few years, had been almost unknown; but in this district they had long ago drained their fields, and had tried other improvements, and he had rarely heard of the farmer being remunerated in the long run for the extra outlay he had incurred. When produce sold high, the tenant might find money for his outlay, but when the time for reaping the advantage arrived, lower prices might be the fashion, and the total outlay was lost. The case of the farmer was different from that of almost all other producers. When manufacturers and others received higher prices, they profited by them to the extent of their accustomed sales. When the farmer received higher prices it was more frequently because the quantity of his produce was diminished; and it generally happened that the increased price sufficed only to make up for the deficiency in the quantity. Some persons railed against both landlords and tenants, and told them they had no claim to relief, as they were the authors of their own sufferings. He must admit they had been so to a certain extent; but we, of the present day, ought not to suffer from the ignorance of those who had gone before us. (Hear, hear.) Others admonished the farmers to become holders of the plough, and make their wives and daughters betake themselves to the poultry yard and the dairy. Agriculture was reduced, indeed, to a most deplorable state, from which, he held, it ought to be extricated, when the occupier of an extensive farm, of necessity a considerable capitalist, a man daily engaged in large and important transactions, and employing, in a wide sphere of action, skill, diligence, and enterprise, could not, without imprudence, exempt his wife and daughters from the drudgery of milking his cows and feeding his pigs. Having all his life been interested in, and given attention to, farming pursuits, and for the last twelve years having farmed 350 acres of land, he felt he might speak with confidence as to the farmers' situation. He had called upon them to produce their accounts, to show by figures the predicament they were placed in; but he thought it was hardly likely they would show them, knowing the habits of farmers and considering that most of their transactions were, or ought to be, for ready money, they had not seen the necessity for keeping and preserving accounts. To look into one's affairs required some little nerve; but no prudent man ought to hesitate doing so. Well would it have been for farmers if they had not been so negligent on this head, for an annual balance sheet would have opened their eyes, and shown them their situation long ago. But if there was reluctance to look into one's own affairs, no wonder there was an unwillingness to exhibit them to others for inspection. This reluctance explained the cause of the scarcity of authentic statements of farm accounts. Feeling that the publication of such an account might do good, and open the eyes of some who were ignorant of the farmers' pecuniary difficulties, he had summoned courage to submit to their examination the accounts relating to the farming on his own occupation, from Michaelmas, 1825, to the present time; and which accounts, he could state, had, both during the time of his own occupation and that of his brother, who preceded him in the farm, been kept with exactness, and distinct from all other accounts. Some might say they knew what a landowner's farming was, and so did he; and as he could not make interest of farming capital, and a fair rent too, he had a right to infer that the tenant-farmer, with, perhaps, restricted capital, and no security for improvements or tenant-rights, could not be in a better position. Until some other farmer's account was shown, exhibiting a contrary result to his own, he had a right to conclude that his accounts (which had been inspected by some practical farmers) showed the true state of the farmer's situation. He challenged the production of a farmer's account, showing that rent could be made with present prices. Glad, indeed, should he be to find that his case was singular, and that his farm and farming were the sole cause of the deficiency which he had experienced in the means of making rent. The statements to which he would first call attention were drawn up only two years ago, and shewed the average outgoings and income of the farm for 22 years, ending Michaelmas, 1848, and free from all estimated stock-takings. They would, therefore, consider the capital invested in stock of the same value at the end as at the commencement of the term. Though the stock was larger at the end than at the commencement of the term it would not affect the conclusions to be drawn from the account. Being aware that some of his items of outgoings were beyond what a tenant would be justified in expending, and that the income had in some cases been reduced by consumption, as in the articles of milk, butter, and fowls, and the expense of horse-keep was greater than a tenant's would be, he had, with the view of making his accounts resemble those of a tenant, deducted from the outgoings and added to the income, according to fair calculation. His accounts, thus altered, would show what must be the tenant farmer's present situation :—

Statement of the Yearly Average Outgoings and Income of a Farm of 350 acres, for a period of 22 years, from Michaelmas, 1826, to Michaelmas, 1848 :—

OUTGOINGS.				£	s.	d.
Seeds bought				59	8	10
Bullocks do.				327	19	8
Cow Stock do.				3	18	10
Sheep do.				239	11	5
Pigs do.				2	16	2
Horses do.				35	6	4
Hay, Oil-cakes, &c., do.				64	9	6
Straw do.				5	5	1
Horse, Cattle, and Pig Corn and Pollard do. ..				64	14	11
Manure do...				40	12	0
Tithes and Rent-charge paid				105	8	1
Poor's Rates do.				78	5	5
Surveyor's Rates do.				9	16	6
Church Rates do.				3	3	9
Insurance Premium do.				2	3	10
Implements (new)	32	0	4			
Deduct considered as paid out of capital	15	0	0			
				17	0	0
Labour	657	10	0			
Deduct as expended by landlord ..	125	0	0			
				532	10	0
Hay-trussing				4	8	11
Thatching	9	15	4			
Deduct landlord's share	1	0	0			
				8	15	4
Drover and Salesman				10	19	1
Farrier	11	0	11			
Extra for Riding Horses	2	0	0			
				9	0	11
Miller	10	0	8			
Off on Housekeeping Account ..	2	0	0			
				8	0	8
Wheelwright	27	8	2			
Deduct considered as paid out of capital	10	0	0			
				17	8	2
Harness mending, &c.				12	14	7
Blacksmith	45	12	5			
Less landlord's share	10	0	0			
				35	12	5
Small Tradesmen	20	13	4			
Less landlord's share	5	0	0			
				15	13	4
Sundries	27	17	11			
Less landlord's share	10	0	0			
				17	17	11
Carpenter repairing gates, tenant's share estimated at				10	0	0
				1,743	2	0

Repairs, Draining Tiles, and Land Tax are excluded from the account.

INCOME.	£	s.	d.
Wheat sold, 22 years' average growth, 7 coomb, 3 bushels per acre, at 29s. 3d, per comb	652	8	4
Barley sold, 22 years' average growth, 9 coomb, 3 bushels 1 peck per acre, at 16s. 6½d. per coomb	401	17	0
Beans sold	17	9	11
Peas do.	10	10	3
Bullocks do.	525	9	8
Cow Stock and Calves do...	28	0	8
Sheep do.	302	4	2
Wool do.	61	12	2
Pigs do, ...	55	14	2

Pork do.	£ 1	17	9			
Add for consumed	10	0	0			
				£11	17	9
Horses sold				34	1	1
Milk, Butter, &c., do.	38	4	2			
Add for consumed	17	10	0			
				55	14	2
Fowls and eggs	10	9	9			
Add for consumed	8	0	0			
				18	9	9
Stones sold				8	10	5
Sundries do.				9	10	4
Straw				1	16	1
Wood and Ash Timber				7	14	6
				2,205	15	7
Allow for keep of extra pleasure horses				70	0	0
				2,275	15	7
Deduct expenditure as above				1,743	2	0
				532	13	7
Interest on tenant's capital of £3,750 at 10 per cent., out of which housekeeping is paid				375	0	0
Balance left for rent of Farm of 350 acres				157	13	7

They would observe that he showed a balance of £157 13s. 7d. for rent, being 9s. per acre for a farm which 20 years ago might have been let for £420, or 25s. per acre; and they must bear in mind, that to show this balance for rent, he had added to the income £105 10s. for horse-keep, milk, and butter, and had deducted from expenditure £180, so that he had favoured the account to the extent of £285 10s. To shew the effect of the two last years' reduced prices of corn upon the farmer's means of paying rent, he had prepared a statement of his farm accounts for that period, ending Michaelmas, 1850, and this would give some idea of present prospects. Instead of troubling them with all the items, he would merely substitute the sales of the wheat and barley on the average of those two years, in the place of those in the 22 years' average accounts; and they would see that the reduced price of corn (to say nothing of that of wheat, which might be set against the reduced outgoing for labour) completely did away with the small balance of £157 odd for rent, shown in the account for the 22 years previous. The amounts received for wheat and barley, the former being sold at 21s. 4d. per coomb, and the latter at 14s. 10d. per coomb, was only £816 (about sufficient for labour, tithe, rent, and rates), being £211 less than on the average of the 22 years. So that in addition to there being no rent, there was not sufficient income to pay the interest on reduced capital, which he would call £3,400, instead of £3,750, though it was really reduced to more. Now, as he thought he had brought forward proof sufficient to convince the most incredulous of the farmers' ruinous situation, and total inability to pay the existing rents, tithe rents, and other outgoings out of the produce of the land at present prices, he would conclude with a few observations on remedies which might be adopted. It was clear that to improve the farmers' situation, and place him in a condition to pay rent, tithe rent, and other stated outgoings, his income must be materially raised, or his outgoings greatly reduced. It was not in the farmer's power to increase the price or value of the former, and he would leave them to say whether they could, by improved modes of farming profitably increase the quantity of produce, and thus bring in more income. The chances were that greater produce might cause even lower prices, if the farmers at large all at once increased supply. Something might be done in some neglected districts towards increasing produce advantageously, but the landlords must find the requisite capital to enable farmers to make these improvements, or give tenants better security for enjoying profits from outlay of capital. Having shown that the farmer had it not in his power to increase his income so as to meet his engagements, made when wheat sold for 30s., and which now sold for 20s. per coomb, and when barley sold for 18s. which now sold for 13s., equal to £3 per acre on the wheat and barley crops together, or 30s. per acre on the arable lands, or 25s. per acre on arable and pasture together, let them look to the other side of the account, and see if the farmer's outgoings could be curtailed so as to meet the deficiency of income. The principal items of expenditure over which the farmers had control were those of labour, housekeeping, and expenditure for manure or food for cattle. As to that of labour, it would be admitted by all acquainted with farming that the farmer had never been extravagant either in the quantity of hands employed or in the rate of wages. At the present time the labourer's wages did not admit of his living as the hard-working man ought to live. Labourers' wages did not exceed 8s. a week, but taking into account the loss of time by wet and unfavourable weather, they did not average 1s. a day (Sunday included), out of which, clothing for himself, wife, and children were to be found. Harvest wages all went to pay cottage rents, which were in general extravagantly high. Certainly, the farmers were not guilty of wasteful expenditure for labour, and thus we saw that high rent and tithes affected the labourers, in fact were paid by them, inasmuch as the farmers, as soon as they found their incomes were decreasing from lower prices, resorted to reducing wages. As to the farmer's houseeping and family expenses, there was room but for little curtailment of outgoing, beyond what followed from the reduced price of food and clothing; and these being in great part their own production, such reduction was little felt. And as to outlay for manure and cattle food, the farmer bought as little of them as he well could. He next came to the important payments of rent, tithe rent, and rates. If present prices of produce continued, the only chance of the tenant farmers being able to hold their farms was in these important items of outgoing being materially reduced. And it was no abatement of 10, 15, or 20 per cent. which would place the occupier in that independent situation which he ought to hold. The landlord might say he could not afford to abate his rent, that he had fixed annual payments to make, which became a charge on his estate when prices and rents were high, and that he had high taxes to pay, and that without his accustomed rents he could not pay his way. But the tenants must be candid, and say plainly that such charges were nothing to them; that they had no hand in imposing the taxes, and if landlords would not reduce rents according to existing prices, then the tenants could not do otherwise than throw up their occupations. The landowners would soon find that they must submit, or take the farms into their own hands. This was being done in this district, but it would not be carried to any great extent. It was the landlords' policy fairly to meet the tenantry. Landlords would soon find that they must do what their tenants were doing, economise, and endeavour to square their outgoings to their incomes. With reduced incomes they would see that the only way in which they could save their estates, if present prices were to continue, was by pressing upon Government the necessity for a wholesale retrenchment and reduction of taxes, or they might rely upon it that, in the course of a few years, we should see our newspapers filled with accounts of sales of encumbered estates in England instead of in Ireland. Those members of Parliament who were returned by agricultural constituencies must not be too squeamish, but vote with those members who had set the example in bringing forward measures of retrenchment, whatever their political opinions might be (applause). Now, as to the tithe rents, which would, if set according to the present price of corn, instead of the seven years' average price, be 25 per cent. less than now payable: he had shown that these required revision, and he thought the tenant farmer must leave the arrangement to be settled between the landowners and titheowners, and in the meantime the tenant must hire his farm tithe free. Then as to the rates, they had always paid them, and these could not be said to be the cause of the present difficulty, for the rates had been reduced in the last few years. Our present system, though perhaps in some respects an improvement on the old poor laws, was bad in principle. The poor man met with little encouragement, and if distress drove him and his family to the Union House, there was no power to set him free and start him afresh. Seeing and feeling the fettered state of the agricultural poor, he had long been of opinion that with other free trade measures we ought to set labour free by abolishing the law of settlement. (Hear, hear.) Under present circumstances, our labourers were unwilling to seek labour or employment beyond the bounds of his parish, and he had no encouragement to do so, for if he should remove from his place of settlement, and health or employment failed him, he knew he would be passed home to his Union House, out of which it was difficult for a man with a family to escape with any chance of finding a home, unless some friend assisted him. To remedy the evil, which he allowed was expensive and burdensome to the farmer, they must have a total abolition of the law of settlement, and every poor man wanting relief must be entitled to it, in whatever parish he might fall ill or become incapable of supporting himself and family. The labourer had an indisputable legal right to support from the land, and he would not say one word savouring of abridging it, knowing that the destitute had as clear a right to demand relief of their wants as any man had to the rent of his lands. There was much to say in favour of a national and equal assessment of all property, real and personal, now that the latter had so materially increased. But this was a point for the landowners and the parties entitled to the other property of the country, to adjust and arrange. In the meantime, if they wished to be clear of rates, they must, in their contracts to hire, arrange that the landlords should defray the rates chargeable in respect of their occupations. He had wished to call their attention to the subject of the National Debt, and the state of our establishments, the competition for land, and the power of distraint for rent, and the burden of taxation; but he must leave these for others to take up, as he was anxious to pass on to one which, with all deference to the meeting, he considered the most important, if they desired higher prices. But he must first make one statement to show how much heavier taxation pressed with low than with higher prices—with limited than with unlimited currency. The taxes in 1815, the most expensive year of the war, were 72 millions of pounds, and the average price of wheat for that year being 65s. 7d. the quarter, the quantity of corn necessary to pay the taxes was 22 millions of quarters. The taxes in 1849 were 53 million pounds, the average price of wheat being 44s. 3d. the quarter, the quantity necessary to pay the taxes would be 24 million qrs., or nearly two millions more qrs. than in 1815. The prices of almost all produce and goods being reduced nearly as much as wheat, and profits being also reduced, it followed that the taxes were really higher now than during the war, looking at the people's means of payment. He had said there was one subject he was anxious to urge on their attention, namely, the Currency Laws. A revision of these laws seemed to him the only effectual way of releasing them from embarrassment, and enabling the nation, and individuals under long-standing contracts, to meet their engagements. But landlords must also meet their tenants. The altering the Currency Laws, and putting them on a right basis, would not alone enable the tenant to pay those rents, which under any state of the law were too high. When he mentioned to farmers that it was to a reform of the Currency Laws they must mainly look for relief, he was frequently told that the currency was a difficult and intricate subject; but if those laws had caused wheat to fall in price from 20s. to 30s. per coomb, surely it was worth their while giving a little attention to the subject. The farmers in Leicestershire and Derbyshire were taking up the subject, and forming currency societies, and a clergyman, the Rev. Mr. Twells, had lately addressed the farmers at Market Bosworth so ably and forcibly on the subject, that he would, with their permission, give them some of that gentleman's observations rather than any of his own. The repeal of the corn laws had probably in some degree lowered the price of corn, but it was worthy of notice that in France, with a protective law in favour of the French farmer, prices had continued to lower under that law. It was easy to show that at former periods our Currency Laws had produced great effects on prices, and it was the opinion of many who had given great attention to the subject, that these laws were still producing a great effect on prices, not only in England but throughout the world. Mr. Taylor proceeded to quote a succession of extracts from the address of Mr. Twells in favour of an alteration of the present currency system. At the conclusion of his address, which occupied two hours, he was very generally applauded.

Mr. W. **Cudden** thought it would endanger the trade of the country to alter the currency laws. If Sir Robert Peel had repented of the law of 1819, why did he put the screw on the bankers in 1844? Because, in his opinion, Sir Robert found it absolutely necessary, for no man understood the currency so well as he did. He had himself studied the question, and had come to an exactly opposite conclusion to the chairman. Why, there was so much money in London at the present time that they did not know what to do with it. If any man in the House of Commons were to propose such a measure as had been suggested, he would not get 100 to support him. Attwood and Spooner, members for Birmingham, who were called the "currency doctors," had brought the question forward, and what had been the consequence? Why, the thing had been laughed out of the House. He agreed with the Chairman in every other point, and his remedy for the present distress was, 30 per cent. off rent, 30 per cent. off tithes, and 30 per cent. off taxation. (A voice, "There's no rent.") It was stated that day fortnight by Mr. Mills, that if they took the charges off the land, the tithe and poor rates, it would be no relief to the farmer, because the amount so saved would be added to the rent. He denied this altogether. He believed there would not be one shilling added to the rent. (Oh, oh! and a voice, "It's very doubtful.") He did not believe it. (A voice, "Other people do.")

Mr. F. **Pretty** moved that the resolutions which had been read by the chairman should be adopted.

Mr. H. **Parker** seconded the motion.

Mr. W. **Fruer**, of Weybread, begged to congratulate them that they had at length arrived at one unanimous conclusion. (Hear, hear.) And that was what the poor abused Protectionists had always advocated, that it was price and price only for their produce which would save them as tenant farmers. (Hear, hear.) Now that this had been conceded, there appeared to be only one difference of opinion as to how they were to arrive at this remunerating price. (Hear, hear.) The chairman had alluded to the natural price of the farmer's produce. To that phrase, "natural price," he wished particularly to call attention, because it seemed to him that upon that point, with due deference to his better judgment, the chairman seemed to be at sea. That gentleman looked at the natural price of corn as the market price of the produce of any country. It had been laid down by the best political economists of the day, that the natural price of the produce of any country consisted of the rent, the labour, and sufficient profit for the farmer to live by—these things put together formed the natural price of the produce of a country. (Hear, hear.) Had we that natural price? (No, no.) What was the price we had? It was a market price—it was a foreigner's price, but not our own. (Hear, hear.) Therefore it was upon that ground, now knowing the feeling that did exist, and he was glad and proud to say that that feeling was increasing amongst them as tenant farmers, that it was to a fair, to a just, and to an equitable system of import duties alone, that they could look for that natural price which ought to be found in every country. (Hear, hear, and cheers.) That appeared to be the difference between them. The market price was not the natural price. That was what Mr. Cobden alluded to; he called a market price a natural price, let the former be what it might. Was it a natural price? (No.) Certainly not. Therefore, until they, as tenant farmers, could arrive at that point, and receive a natural price for their commodity, and while they went on as they were now going on, under a foreign price, it was nothing else could save them but a return to that fair, that just system of import duties which placed the foreigner, the moment he set his foot in our market, upon a fair equality with ourselves. (Hear, hear, and applause.) Their attention had been called to the failure of the corn-laws for many years past. He was quite aware that those corn laws had not attained their object. The great object of a corn law should be to keep the price of the country as near as possible to its natural price, and to keep prices from fluctuating much above or below that level. He was quite aware that the old corn law had not done that. But was that any reason why there should not be a system of corn laws, and a system of import duties of that just and reasonable nature which would attain the desired end? Do not let it be supposed that the tenant farmers wanted a high price for corn. (Hear.) They did not desire a high price, for they knew by bitter experience that an extremely high price did to the community at large as much harm as an extremely low price. All they wanted was a natural price. That was all they asked for; and situated as they were in a country like this, heavily taxed and heavily burdened as they were, they had a right to demand that natural price, and they had a right to express that opinion in every assembly wherever they met together. (Hear, hear, and applause.) The years 1834, 1835, and 1836 had been alluded to by the chairman as being years of prices as low as those of 1849 and 1850. He was quite aware of that fact, but what man in his senses could ever advance 1835 as a low-priced year, and compare it with the present? It was not the price per coomb that the farmers looked at; it was the aggregate price per acre which he made. (Hear, hear.) How, then, could any man in his senses attempt to cajole the tenant farmers—for he could call it nothing else—by wishing to compare the year 1835 with the years 1849 and 1850? It was well known that the crops in that year were much greater than had been known in the memory of man. It had been told them that they ought not to suffer from the ignorance of their ancestors; he thought they would all accede to that as a truism. And did not the present state of things tell them that it had been the ignorance of their ancestors—(Hear, hear)—or something worse, which had induced them to get rid of the corn laws in the way they had? He would ask, what had been the opinions of gentlemen who had advocated the abrogation of the corn laws? The speaker here quoted from a speech of the late Mr. Harvey, then secretary of the Harleston Farmers' Club, to show that that gentleman, though a free trader, had declared that it was only just to the farming interest, if the corn laws were repealed, that all existing contracts should cease, that rents should be reduced by the landlords 25 per cent., and that the malt tax should be repealed. Mr. Harvey was as strong an advocate for free trade as any man in that room. But he was a friend of free trade in its pure and abstract sense; he was not a friend to free trade in corn only, for the purpose of crushing the tenant farmer to the earth. The discussion in which Mr Harvey took part, ended, after patient and mature deliberation, in the adoption of this resolution:—"That the consideration of a free trade in corn, as affecting the interests of the tenant farmer, has convinced the meeting that protection is indispensable." This was the opinion of the Harleston Farmers' Club then; but he might be told that the Club had reversed its decision. In answer to this, he would remind them that this took place after the disruption of the Club, when the great majority of those who were strongly opposed to free trade had left; therefore it was very easy, when the members were nearly all on one side, to account for the decision at which they had since arrived. They had been also told that it was not the corn laws alone, but the currency, which had reduced the price of corn so low. If that were the case, if the currency had reduced the price of corn so low, as it was at the present moment, why did it not produce a similar effect in 1847? We had the same currency law then that we had now, but it did not keep the price of corn down then? (A voice, "It was the famine.") Now, he believed that the only remedial measure they could ask for was, as he said before, a fair system of import duties. But he might be told, as he dare say he would be told by the free traders, that the imposition of import duties would be taxing the poor man's bread. What, did they mean to tell him that we had a wholly untaxed loaf now? (No.) If the principle of free trade was to be carried out, let it be carried out as far as it would go; if they were to have untaxed bread, untax the tenant farmer who produced home-grown bread (Hear, hear); and then, and not till then, would they have an untaxed loaf. And how was the home-grown bread of the labourer taxed at the present moment? Why, it was taxed by the cheapness of his labour; and not only by the cheapness of his labour, but by the diminished quantity of that labour. (Hear, hear.) It was said that 7s. a week, low as that was for the labourer, was not so low in proportion to what wages were when wheat was 30s. a coomb. He was well aware that it was not, provided the labourer got it. But did he get it? Did the poor man get his regular work? (No, no.) Certainly not. There was a time, sixteen years ago, when he was proud to make use of the observation, at a meeting of the Harleston Farmers' Club, that a different state of things was being brought into existence with regard to the situation of a master towards his men. Under the old poor law it was the custom, and it had become a most iniquitous one, to make the labourer take care of himself every wet day, when the master did not want him. But when the new poor law came into operation, the master saw he had no longer the poor rate to send his labourer to, and therefore he said, "I must do my best to keep that man regularly employed." He knew, from his experience as a constant attendant at the Board of Guardians for the last sixteen years, that there was then being brought into existence a better state of things. But this state of things was again being knocked on the head. The poor man worked for his master as long as the weather suited, and as long as it was convenient for his master to employ him. But the master had no longer the means in his power, or the money in his pocket to put the labourer to the unprofitable work he used to in bad weather, to keep him from the poor-rate. And what was the consequence? The poor man's children used to be constantly employed, as well as himself; but did we see those children employed now? What were the scenes they witnessed at the meetings of their Board of Guardians? Were they not enough to harrow the soul of any man who had that feeling which he ought to have for the poor man and for his own labourer? The labourers came with their six or eight children, and asked the Union to support some of them, saying that with 7s. a week it was impossible for themselves to do it. And what had been the result? He had taken the trouble to procure a comparative statement of the number of able-bodied men who had received relief in the workhouse of the Hoxne Union, in the 52 weeks of 1848 and 1849, and the 47 weeks of the year 1850, up to the present time, with the weekly average in each year. He had taken this statement from the books of the Union, and he thought it would show what was the present depressed state of the poor man, as well as that of his master. The aggregate number relieved in 1848 was 767, giving an average of 14 per week; the aggregate number for 1849 was about 950, an average of 18 per week; and for the 47 weeks of 1850 the aggregate number was 2,143, giving an average of 45 per week. (Hear, hear.) This was an increase, they would observe, of 120 per cent. over the past year, in able-bodied paupers alone. If these facts which came before them did not show the state the poor man was in, ay, though he had got his cheap loaf, he did not know what would. Why, the cheap loaf, under such circumstances as these, was nothing more than a tantalizing snare and delusion to the poor man, because he had not the means to buy it (applause.) Give the tenant farmers a fair price for their produce, give them the natural price, and then the poor man would be enabled with constant work to buy much more bread than he was now enabled to buy. The state of the adjoining Union, the Depwade Union, presented similar results. The aggregate number relieved in that

Union in 1849 was 1790, an average of 34 a week; in 1850, the aggregate was 2,276, giving an average of 49 per week, or an increase of 42 per cent. The speaker next adverted to the position of the tenant-farmers in reference to the advice given them to adopt improved methods of cultivation. It was not now the question, how they were to go on farming well so as to gain the most money. No; that was not now the question; the question was, how were they to farm so as to lose less? They had seen that it was impossible even to pay rent at all with present prices; and not only that, but they had seen that the tenant's capital was reduced one-half in value. And who were the men who advised them to farm higher? To use a homely expression, they were, generally speaking, men who did not know the head of a cart-horse from the tail of a cow (laughter). And these men, brought up behind counters, these were the men who came forward and pretended to teach farmers their business. He next launched into a tirade against free traders, and then proceeded to show the fallacy of their assertions that the present low price of corn was only temporary. Was it likely, he asked, with a low price of wheat in France, that we should see any higher price in England? It was preposterous to think that we could have it. As long as the French could find a market here which would give them a margin of profit, they would be sure to bring their corn here. But the chairman had told them that France was a protected country, and yet they had a low price of produce. He would grant that it was so, but the beauty of it was the French could afford to live at that low price of produce: we could not. (A voice, "What is the reason?") Their burdens were different from ours; they were situated very differently from ourselves. And in addition to this, their corn laws were based upon such a principle that they were bound, when foreign corn was brought into that country, to manufacture a certain portion of it into flour, and send it out to other countries. This was what fell so heavily upon our millers here. Why could not our millers send their hundreds and thousands of sacks of flour into the manufacturing districts, as they used to years ago? Because the French miller could undersell them. That was one of the effects of free trade. Mr. Fruer next touched upon the Law of Settlement, observing that there were so many difficulties surrounding the whole question, that it behoved the Legislature to be exceedingly wary how they interfered with it. He explained at length his own objections to any alteration in the law, and concluded by moving as an addition to the resolutions proposed for adoption—

"That a remunerating price, a natural price, for the farmer's produce can only be secured to him by a fair and equitable system of import duties."

The reading of the motion was greeted with mingled cheers and hisses.

In answer to an observation from the chairman, Mr. Fruer explained that he did not object to the original series of resolutions, nor did he move this as an amendment, but only as an addition.

Mr. J. Ebden seconded the *addendum.*

Mr. Cudden moved as an amendment the following set of resolutions:—

"That the corn and currency questions having, after mature deliberation, passed the Legislatures, by large majorities, may be considered at least settled for the present, and any attempt to disturb or alter the existing laws would fail, and, therefore, end in disappointment. That the only safe and practicable mode, to relieve the distress so justly complained of, is in a large reduction of rent, tithes, and taxes.

"That the heavy tax on malt operates most oppressively on the British farmer, labourer, and working classes generally, to prove which it is only necessary to state that while the consumption of bread corn has, within the present century, enormously increased, there has been no increase in beer, the national and wholesome beverage of the people. That the Act for the commutation of tithes having been enacted before the alteration of the Corn Laws, and, as the present mode of taking the average acts unfairly to the farmer, a re-adjustment of the present law is imperatively called for.

"That, for the above reasons, this meeting is of opinion that petitions to both Houses of Parliament be prepared and adopted, praying for a repeal of the malt duty, and an amendment in the Tithe Commutation Act."

After a pause,

The Chairman observed that as the amendment had not been seconded it must fall to the ground.

Mr. Cudden enquired if there was no gentleman who agreed with him that the only thing which could be done was to reduce taxation, rent, and tithes? If not the amendment must go.

The appeal met with no response, and the amendment accordingly dropped.

The Chairman said he thought the point touched upon in Mr. Fruer's *addendum* was already embodied in the original resolutions.

Mr. Fruer—They do not go far enough.

The Chairman—We ask for enquiry upon that point, as to the effects of the removal of Protection.

An Auditor—You admit that nothing can save us but a fair price.

The Chairman—I have pointed out one way, and I have pointed out that under protection laws you have not had a fair price.

The original resolutions were then put and agreed to unanimously.

Mr. Fruer's proposed addition was also put to the vote, and carried by a small majority.

A petition, embodying the original resolutions, was next agreed to, but without the motion of Mr. Fruer being incorporated with it, that gentleman having stated that he had no wish to interfere with the petition, as he was satisfied with the expression of the meeting.

The Chairman then read a letter from Mr. Burroughes, one of the Members for the Eastern Division of the County, regretting his inability to attend the meeting on the ground of a prior engagement; and also read one from Mr. Wodehouse, in which that gentleman promised to be present should the state of his health permit.

A vote of thanks was passed to the Chairman, after which the meeting separated.

EXPENSES OF CULTIVATING A HEAVY CLAY SOIL.

Sir,—I herewith send you a statement of what, after careful calculation, I believe will be found to be the expenses of cultivating a heavy clay soil on the following system :—

1st year, fallow, one-half bare and one-half vetch.
2nd year, barley, one-half sown with clover.
3rd year, one-half seeds (mown and fed), one-half beans.
4th year, wheat.

I have, as you will perceive, taken the expenses on an acre of the different crops, and then a calculation of the expenses and returns for the course. My object in sending it is to find if such may be taken as the average expenses and returns on a heavy clay farm; and if so, how the occupiers of such land are to exist, even paying a much less rent than that put down, nothing being charged for interest of money, or for tenants' time, &c., but merely what the horse and manual labour, with seeds and rates, amount to.

I believe it may be useful that farmers should make careful calculations of what the operations for each crop cost, and if those I send you may be the means of inducing others to furnish the result of their experience, I shall be much gratified.

I am, sir, yours very obediently,

Jan. 17, 1850. A Constant Reader.

FIRST YEAR.—SUMMER FALLOW.

	£	s.	d.
First ploughing	0	14	0
Second do.	0	13	0
Scuffling twice	0	5	0
Drag harrowing	0	3	0
Third ploughing	0	12	0
Couching or twitching, and cleaning ditches ..	0	2	0
Rates	0	5	0
	£2	14	0

SECOND YEAR—BARLEY.

Drilling	0	2	0
Four bushels seed	0	12	0
Harrowing	0	1	6
Trenching	0	0	6
Weeding	0	1	6
Mowing	0	2	0
Carrying and stacking	0	7	6
Thrashing	0	7	6
Winnowing, marketing, and carrying out ..	0	6	0
Rates	0	5	0
	£2	5	6

THIRD YEAR.—SEEDS.

Seed sown	0	10	0
Sowing, harrowing, and rolling	0	3	6
Mowing, turning, &c.	0	5	0
Carrying, stacking, thatching, &c.	0	9	0
Rates	0	5	0
	£1	12	6

FOURTH YEAR.—WHEAT.

Ploughing	0	15	0
Seed	0	10	0
Dibbling	0	8	6
Harrowing	0	1	0
Trenching	0	1	0
Hoeing twice	0	7	0
Rolling	0	1	0
Reaping	0	8	0
Carrying and stacking	0	10	0
Thrashing	0	8	6
Winnowing, selling, and carrying out ..	0	7	0
Rates	0	5	0
	£4	3	0

FIFTH YEAR.—VETCH FALLOW.

Seed, 3 bushels	1	1	0
Ploughing 15s., drilling 2s., harrowing 1s. 6d. ..	0	18	6
Second ploughing 13s., scuffling twice 5s. ..	0	18	0
Harrowing 3s., third ploughing 12s.	0	15	0
Rates	0	5	0
	£3	17	6

SIXTH YEAR.

Barley, as before	£2	5	6

SEVENTH YEAR,—BEANS.

Manure, hauling, spreading, &c.	5	0	0
Ploughing 14s., seed 11s., dibbling 7s. 6d. ..	1	12	6
Harrowing 1s. 6d., hoeing 7s., hacking 7s. ..	0	15	6
Carrying, stacking, &c., 7s., thrashing 5s. ..	0	12	0
Selling, carrying out, and winnowing ..	0	6	0
Rates	0	5	0
	£8	11	0

EIGHTH YEAR.—WHEAT.

Dibbling and ploughing, 3s. less	£4	0	0

Dr.	£	s.	d.
Half an acre of bare fallow	1	7	0
Half an acre of vetch do.	1	18	9
One acre of barley do.	2	5	6
Half an acre of seeds do.	0	16	3
Half an acre of beans do.	4	5	6
One acre of wheat do.	4	0	0
	£14	13	0
Rent of 4 acres, at 25s. per acre	5	0	0
	£19	13	0

Cr.		
First year, bare fallow		0 0 0
Do., vetch do.		0 15 0
Second year, barley, 4 qrs., at 23s..		4 12 0
Third year, seeds		1 7 6
Do., beans, 27 bushels, at 3s. 4d.		2 5 0
Fourth year, wheat, 27 bushels, at 5s.		6 15 0
		£15 14 6
One acre of barley straw	£0 10 0	
Half an acre of bean do.	0 10 0	
One acre of wheat do..	1 0 0	
		2 0 0
		£17 14 6

Expenses of four-course	19	13	0
Produce of do.	17	14	6
Loss	£1	18	6

THE LONDON FARMERS' CLUB.

MONTHLY MEETING OF THE COMMITTEE OF MANAGEMENT, JAN. 6.

Present—Messrs. E. Aitcheson, J. Carter, W. Cheffins, W. Fisher Hobbs, J. C. Nesbit, W. Shaw, of the Strand, and J. Tyler.

W. Fisher Hobbs, Esq., in the Chair.

The minutes of the last Committee Meeting were read, confirmed, and signed by the Chairman of this day. The minutes of the General Annual Meeting were also read.

The following gentlemen were elected members:—

N. G. Barthropp, Cretingham Rookery, Woodbridge, Suffolk
W. T. Copeland, M.P., Leyton, Essex
R. C. Gale, Winchester
W. Henderson, Hyde Park Corner
E. Reynolds, Wallington Lodge, Carshalton, Surrey.

The names of some other gentlemen were read for the first time.

Mr. J. Thomas, of Lidlington Park, Woburn, Beds, was elected Vice-Chairman of the Discussion Meetings for the year.

The following gentlemen were re-elected on the House Committee:—Messrs. E. Aitcheson, J. Beadel, W. Fisher Hobbs, P. Knight, and W. Shaw, of the Strand.

The following subjects were selected for discussion during the year:—

LONDON FARMERS' CLUB.

SUBJECTS FOR DISCUSSION IN 1851.

February 3.—How far Taxation enters into the Cost of Agricultural Produce.—Proposed by Mr. S. Cheetham, of the Grove, Eling, Southampton.

March 3.—On the Adulteration of Artificial Manures, and the best practical means of Detection.—Mr. J. C. Nesbit, of Kennington Lane.

April 7.—To what extent the Cultivation of Land in England and Scotland is affected by Soil, Climate, and other circumstances.—Mr. R. Baker, of Writtle, Essex.

May 5.—On the best means (legislative or otherwise) of inducing Capital to be more freely invested in Land, and the Benefits which would result therefrom to all Classes. —Mr. E. Tattersall, Jun., of Hyde Park Corner.

June 2.—On the advantage of Covered Home-stalls, as regards the fattening of Stock and manufacture of Manure. —Mr. J. Beadel, of Broomfield Lodge, Chelmsford.

November 3.—On the injurious Effects of the present Beershop system in the Agricultural Districts.—Mr. W. Fisher Hobbs, of Boxted Lodge, Colchester.

December 9.—Are the Interests of Landlord and Tenant promoted by the Law of Distress for Rent?—Mr. W. Shaw, of the Strand.

The Discussions will commence at Half-past Five o'clock, P.M

CALENDAR OF HORTICULTURE.—FEBRUARY.

The weather of the first weeks of January was almost unprecedentedly mild; that of the entire winter, indeed, justified the prognostic afforded by the autumnal equinox: it proved open, with a prevalence of rain and wind—not indeed in excess, but yet remarkable. The consequence has been a degree of verdure which far surpasses that of the past summer. Vegetables of every description have been most abundant, and exceedingly good; and growth is perceptible in several shrubs, among which the rose stands pre-eminent, some buds being more than an inch long. One might be led to some apprehension of a serious check; but in good truth, such is the variableness and mutability of our meteoric phenomena, that it would be unwise to indulge in gloomy anticipations.

VEGETABLE DEPARTMENT.

The weather must be our guide. If the ground be either frozen or swamped—two conditions equally preventive of labour—the gravel walk, in the latter case, can be cleared from weeds, turned over, renewed as their state may require, and rolled, stakes and pea-sticks got ready, tallies, labels, &c., &c., prepared in advance; these hints may be followed out profitably.

The seasonable operations of February would embrace:—

Sowing within the two first weeks, early *peas*,* long pod, white, and green Windsor *beans*, the last to be gathered while young in the pod, to preserve the green tint when boiled.—*Cabbage* and Savoys to come in early. Cabbage plants from the autumn-sown beds should be removed to a plot of rich ground, to keep up the spring supply. A little *cauliflower* seed sown in a box or pan, in gentle heat, would quickly bring forward a set of young plants, which should be pricked out in a frame at some inches asunder; and when grown to a fair size, be hardened gradually by admission of air; finally removed to the open border, and there treated under glasses exactly as the autumn raised cauliflowers.

Winter *spinach* is liable to suffer during winter from slugs, and sometimes whole rows become patchy, the roots dying in the ground: dustings of air-slaked lime are a remedy for the first; for the latter little can be said, as it is probable that the ground is in fault; in which case the blank portions should be removed, fresh loam substituted, and a sprinkling of seed given forthwith: thus the deficiences may be made good without much loss of time. If the plants have gone through the winter pretty well, let two or three ounces of the best guano be sprinkled evenly over the surface between the rows, and forked in. This potent manure comprises the elements of fertility, it is lacking chiefly in bulk of organic matter; but otherwise is perhaps the most comprehensive stimulant of early growth that we possess, and the ground will lock it safely up.

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* See January, p. 88, col. 1—"To raise early peas."

We have had no winter as yet, but it may come suddenly, and make havoc with our stock of *cabbage, broccoli, lettuce,* and other things replete with juice. In that case fail not to sow seeds in pans under glass, or oiled paper frames. Our market gardens present the most instructive models. Under Providence, nothing appears (as W. Cobbett observed) to be "beyond the ability of those skilful men" (the market gardeners).

Planting of early potatoes.—We have for years poisoned and degraded this noble root: it became sick, and its extinction was threatened—let us now begin well "at the beginning." Persons desiring to grow an early crop of potatoes to perfection are recommended to possess themselves of Mr. Cuthill's cheap treatise; the few pence thus laid out, might not only secure their object, but repay the expenditure many times over in the first season. I have alluded to the system on several occasions, and now refer to it by describing in a few lines its leading principles. Mr. Cuthill employed the ash-leaved kidney only; but that variety of "no blowers" is, under common treatment, so little productive, that public growers begin to be shy of it; hence the true earliest shaws are substituted, the price of which, in Mr. Carter's last catalogue, is quoted 1s. 6d., whereas that of the ash-leaved is 2s. 6d. per peck. So long as any vestige of disease may remain, manure about the planted tubers ought to be avoided, and in its place fine dry ashes, carbonised turf, peat, or charcoal screenings, substituted. I say this, not with any view to the primary cause of the great epidemic; but solely to prevent, if possible, the introduction of fluids which by the stimulation of fermenting manures would tend further to debilitate a lax tissue. Let us act, therefore, upon the antiputrescent tonic and drying principle, and thus for the present sacrifice bulk for quality. Mr. Cuthill plants his entire tubers in regular furrows of prepared ground, the rose or crown ends uppermost, and then covers them with earth set up in ridge, the centre of that extending lengthwise in a line over the tubers. Nothing more is done, the potatoes are thus protected by the depth of earth, and by the time that the shoots emerge, frosts may no longer have power to cut them off. Potatoes, by modifying their winter treatment, can be brought to table by the third week of May, and, in fact, the Lancashire growers obtain their celebrated lemon kidneys at that early date: but the reader should peruse Mr. Cuthill's directions, as applicable to these localities.

The mushroom-house offers great facility to the production of *sea-kale* and early *rhubarb*; it is dark, and therefore blanches the former, and forwards the growth of the latter by its steady and mild temperature of about 50 to 55 degrees.

Asparagus forcing in pits and frames will yet proceed to keep up the succession.

As common salt has been proved to be congenial, the plants in the frames may be watered occasionally with a weak solution of it, heated to about 80 degs. One caution must be observed in the use of dry salt on the open beds; it must never be applied after growth has commenced; but so long as the plants are torpid, which they will be at the beginning of this second month—it may be safely scattered over the beds of roses till the surface become white as after a scud of snow. Some persons talk of an inch deep layer—one, in fact, sufficient to prevent the growth of weeds throughout the spring. The inexperienced gardener should proceed with caution; but at all events salt may be trusted as a safe manure for sea-kale and asparagus, both being maritime plants.

HARDY FRUIT DEPARTMENT.

The *pruning* of *currants* and *gooseberries* should be early completed: the methods have been too often detailed to require repetition. After pruning, and forking-in the manure, use quick lime, as recommended in the last Calendar, if the trees had been infested by caterpillars.

Raspberry canes should be reduced to five or six cut back to the bend, and secured in open order to a trellis, if convenient. A mode of training to a line of stakes, sloping to the north, at an angle just sufficient to keep the fruit-bearing canes apart from the new growth of the coming spring, possesses considerable and obvious advantages. After pruning, fork in manure, as above directed, for currants, &c.

Apricots (whose mode of bearing combines that of the peach and the spur-producing trees), being early bloomers, require the first and most protective treatment: train-in the best-placed horizontals and oblique shoots, and prune back the spurs, close home to the fruit buds; then protect the trees with canvas screens.

Peach and *nectarine*—In mild weather the danger arises from precocious advance of the bloom. If possible, guard from sun by canvas or bunting, and refrain from pruning till the latter end of the month.

The simplest and most cleanly wash for wall-trees, and for general purposes, is a sulphuret of lime, prepared by pouring three or four gallons of boiling rain water over as many pounds of hot-lime, first slaked by a little water, with a fourth of its weight of flour of sulphur. The hot rain water poured over these, being thoroughly stirred, will produce a yellow liquid, which, after becoming clear, should be syringed forcibly (while pretty warm) over the pruned trees, and the intervening spaces of wall. The grout applied by brush to the stems of gooseberries, &c., &c., will remove the lichens and mosses that infest them. This wash will not keep long, as it is decomposed by air.

Treat *cherry* and *plum* trees, on wall or espalier, as the apricot, and also wash them to destroy the germs of insects.

Apples and *pears* trained.—Prune back to the fruit buds, and shorten those spurs which become too rambling; such appendages render trees very unsightly, and spurs can be renewed as well as induced. The sulphuret wash can be successfully used with these trees.

Plant fruit trees, though the autumn is much to be preferred. In planting, open the ground, and pave it with slates, or flat thin bricks, a foot below the surface; the object is to force the roots to take an horizontal direction. Use no manure, but employ a fine maiden loam, and chopped turf as the covering soil. On the tiles, &c., I would lay three-inch thick turves, grass surface downwards; and upon these place the roots, spreading them out carefully, after amputation of every member that taps; cover the roots with fine soil, washed in from the rose of a water-pot, but not forced on them by shaking and treading. When thus planted near the surface, secure standard trees by slanting stakes, and wall trees by shreds or tyers.

Notices of the forcing departments and flower garden are deferred till March.

I conclude with a few lines on *cucumbers* and *melons*. These are raised by a variety of methods; but the hot-bed is at the command of most persons. Stable manure of best quality, and leaves, are "thrown together, and turned twice a week until the dung has lost its rankness. Construct a bed three feet high, and six inches wider on every side than the frame, beating it firmly with the dung-fork. Put on the frame and press it firmly down. Make a lining of two feet in thickness, and within six inches of the top of the box. Insert a thermometer a foot below the surface of the dung, and examine it every morning, until it stands between 70 and 90 degrees: the top heat should not exceed 65 degrees. Sow the seeds in light, rich, sifted soil. Keep the pots near the glass, and tilt the lights a little at the back of the frame, in order to strengthen the plants, as well as to permit any rank steam to pass off freely. As soon as the seed-leaves are fully developed, pot them off singly into 48 size pots—cucumbers into a compost of leaf-mould and light loam, in as rough a state as possible; water them with a fine-rosed pot, and replace in the dung frame." Melons are sown and re-potted in more firm and loamy earth; otherwise treated as cucumber seedlings. Sow early scarlet-fleshed kinds first, and towards the latter end of February the green-fleshed and Persian varieties. In extracting this passage from the *Gardeners' Magazine of Botany*, I have added leaves to the hotbed, but otherwise have strictly adhered to main facts. Every seed should, I think, be sown point downwards, about half an inch deep. A mild sweet hotbed is most congenial to the seedlings in their infant stages.

Final Retrospect.—The weather remains mild; frost has approached from time to time, but has been repulsed by a strong south-westerly current. Thus things remain pretty well as they were, and no prognostic of the future is apparent. Primroses and snowdrops come into bloom; but above all the flowers that adorn the winter, the Christmas rose (*Heliborus niger*) has been conspicuous.

Jan. 21. John Towers.

OPERATIONS FOR FEBRUARY.

Flower Garden.

The extreme mildness of the weather up to the present time has induced an unusual degree of activity in the vegetation of many plants, which at this early period is far from desirable. Roses, in many instances, have pushed out shoots to the length of three inches; a few hybrid Rhododendrons are in full and beautiful flower, whilst many herbaceous plants—bulbous in particular—are pushing up very rapidly. As we are not at present safe from the visitation of very severe frost, we must keep a vigilant eye on the weather, and have abundance of protecting materials at hand in readiness for possible emergencies, for we may be sure that an increased degree of tenderness and susceptibility will be induced in plants which our experience tells us would have been far better in a dormant state. It is also worth our while to reflect a little on the probable consequences of the influence of bright sunlight, when accompanied with even very slight frosts, and to take immediate means to shade some of the choicer sorts from its influence. I feel convinced that much mischief results from the effects of sunshine on frozen plants, more even than from severe frost in the shade. I mention this merely by way of suggesting precautionary measures; as the subject has been, from time to time, very ably brought forward in the pages of this *Journal*, and its importance is, I trust, fully appreciated. The general work of the flower garden should now be followed up with increased activity, particularly where alterations and planting are still in progress, as it will not be safe to prosecute these much longer—the more so if the weather still keeps mild. The trenching-up vacant beds and borders should be followed up, and they will derive much benefit from being well knocked about with a fork on dry frosty mornings. Grass should be pulled, swept, and rolled occasionally. Box edgings may be planted; gravel walks should be kept well rolled—an operation which is best performed after heavy rains; but, if it is desired to roll them after frost has lightened up the gravel, burn a good dry faggot inside the roller previous to using it, which will prevent the gravel from licking up.

Herbaceous Plants.—But little can be done here at present in established beds, beyond affording ample shade and protection to such as show symptoms of premature vegetation; but where new beds are required, they may be furnished at once from the reserve garden, which should then be dressed and trenched up, to be in readiness to receive the cuttings from the larger plants at the annual digging and regulation next month; it is best to give these a year in the reserve garden; after which, they bear removal, and flower better.

Annuals.—A selection of Hardy Annuals may be sown immediately, in light sandy soil, on a warm dry border. After digging the border and levelling it, it is a good plan to draw drills, and lay in them pieces of strong fibrous turf, an inch or so thick, and two inches square; cover these slightly with soil, and sow the seeds thereon, and then cover and rake all level: as soon as the plants are of sufficient size to transplant the pieces of turf will be found to assist that operation wonderfully. A few tender annuals may be sown in pots or pans on moderate heat for very early flowering; also, do not forget a pan of Delphiuium sinensis, for flowering in the autumn. A good supply of the dwarf Rocket and tall-branching Larkspurs should be sown immediately in well-prepared beds or borders. Pits and frames, or other structures where the bedding stuff is stored, will now require an extra degree of attention, as it is probable that the cloudy mild weather has had the effect of starting some of the more succulent sorts into action rather prematurely, rendering them much more liable to damp off, thereby requiring more care in excluding frost and maintaining a dry cool atmosphere in the interior. Guard also against sharp, cold, cutting easterly winds, which, from their prevalence during the next three months, may cause a vast amount of destruction, if not guarded against—more, probably, than all other atmospheric agencies put together. Propagation had better be commenced as soon as the necessary means are in readiness; proceed gradually, and do not push the growth too fast, and endeavour to keep the bottom heat rather in advance of the circulating temperature, as the great object is to get a good sturdy top with plenty of roots; and the formation of these must be gradual; any attempt at forcing produces etiolation and consequent weakness. Use a good portion of sand in the composts for striking cuttings, and also in potting off store cuttings, which may be commenced as soon as the convenience of a gentle heat can be commanded for the purpose. Those who have to bring forward a large stock with little convenience, will find their account in beginning early; but with plenty of convenience, this operation may be more generalised, and left a little longer. Dahlias should now be looked over, and the choice sorts started in heat to furnish cuttings; very dry and shrivelled roots should be potted immediately. All plants intended to furnish cuttings, such as Salvias, Petunias, Heliotropes, &c., should be immediately placed in heat: an early vinery is a good place. The potted roots of Canna should also be placed in heat.

Rose Garden.—It will be advisable to defer the general pruning of these for a time, because in their present excitable state, and should this month be mild, they will break early and become susceptible of injury from spring frosts, which are often very destructive after mild winters. Large established plants of the tender Tea-scented and Noisette Roses should have some kind of shelter afforded them; if in exposed situations, some branches of spruce fir or yew, or even furze, will answer; if against a wall, a mat, supported on stakes, in front of them, so as not to touch the trees, answers the double purpose of shading from the sun and breaking the force of cutting winds. Smaller plants of these tender sorts will, doubtless, be laid in under a north wall, where they can be readily protected.

Florists' Flowers.—Pansies will require to be pegged down occasionally, if they are much grown. Some light sandy soil, laid carefully about them, so as to leave only the tops out, will be of great service to them in case of severe weather. Towards the end of the month, give the beds a top dressing of very decayed cow manure, which should be very slightly forked in. In very severe weather a light covering of brake will be of material benefit to them, and also to carnations, pinks, turban ranunculus, and anemone. Some light boards or other means must be used to prevent this covering from being blown about by winds; otherwise the friction which this would cause will injure the young growth, and do more harm than good; and here let me observe that in every operation we undertake our best endeavours should be exerted to do it well and effectively. In the case in point, a person has a nice bed of choice pansies. Severe weather approaches, and a covering is recommended, and seems advisable; it is laid on, *but not secured;* a wind arises in the night, and in the morning the plants are knocked about in all directions; the operator begs an inverted blessing on all coverings, and propagates their uselessness, alleging his *experience* as a conclusive argument. Tulips and hyacinths, which are now pushing through, may have a handful of sand laid upon each plant: about the second week of the month is the best time to plant the mixed ranunculus: the beds should have been as well prepared as the season will allow. After placing the roots in the drills, I find it a good plan to just cover them with white sand; they like it, and it facilitates the finding the roots at taking up time.

Shrubbery.—Finish planting as soon as possible, also the thinning and pruning, so that the forking up, levelling, and regulating the ground work may be proceeded with. All this rough kind of work should be finished off early, both for the welfare of the plants, and also that every advantage may be taken of favourable weather for the prosecution of the more important spring-work. Newly-planted choice shrubs and trees should be mulched.—J. W. C.

FORCING.

Fruiting Pines.—Perhaps there is no period during the year which requires from the forcing gardener greater energy and universality of mind, as every department is daily becoming more or less occupied. The duties attending the management of forcing houses admit of no relaxation. Vegetation at this time is like a wayward child that will bear no constraint which would, in some way or other, disarrange its functions in proportion to the amount of interruption. Do not caress at one time and neglect at another, but hourly and daily give to every thing unremitting attention, and nothing less will do. Only those who are practically acquainted with the routine of a forcing establishment can fully estimate the arduous and complicated duties the gardener has to perform. But even with care and skill combined, first-rate productions cannot be produced unless he receive a hearty co-operation on the part of the employer, to furnish the means whereby his ability can be brought into full action; and if this is not complied with, mental and physical labour avail but little. It is an easy matter to write calendary instructions; yes, much easier than to convince some gentlemen that simple situations (it may be) are necessary for their due performance. For the present I shall leave plants in fruit under last month's instructions, but with this difference, that, as the month advances, give more moisture, and increase the temperature during sunshine. Plants which have been comparatively at rest since the beginning of winter, will, in the majority of cases, require a few additional degrees of bottom heat. It is with some persons customary to renovate the bark bed entirely; but this is unnecessary unless the heat has declined considerably. Rather raise the pots nine or six inches, and add fresh material to the surface, which will, as the season advances, in conjunction with solar and fire heat, produce all that is required. I would remind young professionals, that no point in pine growing requires so nice allocation as the application of bottom heat; for if the roots are scorched, we render the labours of the past year abortive in proportion to the damage, and destroy the prospect of the present beyond remedy. A steady increase to 80 or 85 degrees will be found congenial, and more than this is decidedly injurious.

Succession Plants.—Begin gradually to increase the bottom and top heat a few degrees, so that the roots may, by the beginning of next month, when the potting-season has arrived, be in action; for it is a bad practice to pot pines when the functions are weak. Correspondingly admit air to prevent the foliage contracting a sleazy character. As soon as possible get soil for potting under protection, so that when required it may be in suitable condition. What I constantly use is light fibry loam and heath soil in equal proportions; and I occasionally add a little leafmould if the loam is more adhesible than I desire. When these are thoroughly mixed, reject the fine, and only use the rough; for mechanical arrangement is of equal, if not of more, importance than the chemical ingredients. During wet weather prepare potsherds, and forward any other item which will promote activity when the potting-season arrives.

Vinery.—The past month has been unfavourable for fruit-forcing, owing to the hazy, sunless state of the atmosphere, which has kept vegetation in check. It is only under sunshine that the leaves can decompose the crude sap by the process of exhalation and respiration, and whatever interferes to prevent the free action of the respiratory functions, tends to reduce, in proportion, the amount of organized matter. The retention of undecomposed matter in the tissue, gives the wood a dropsical character, and while so charged, can neither attain strength nor tenacity. The production of organized matter rests entirely with the leaves; they alone can combine and decompose the salts and saline ingredients absorbed by the spongioles—no chemist, however learned in his profession, can produce one atom. From what has been stated, there will, I presume, be no difficulty in persuading the mere tyro to preserve his vine leaves from injury. More than one bunch of grapes should not be allowed on a spur, and choose those of a turged character in preference to those of loose flexible habit, which are apt to run "blind" just before the flowers expand. Remove all superfluous shoots, and keep constantly in view that the maturation of the wood does not depend on the greatest amount of foliage we can secure, but on the quantity that can be exposed to the direct action of light. When the flowers begin to expand, increase the heat a few degrees, and keep the atmosphere dry till fecundation is completed. Commence a successional house, and let every action be carried on with caution. If too much heat is applied, the ascending fluid rushes to the extremity of the shoot instead of diverging regularly into each bud. The night heat must not exceed 50 to 55 degrees till the eyes are fully on the move. Syringe the vines and every part of the house two or three times daily; but neither here, nor to more advanced vines, apply moisture in the morning, particularly when the weather is cold. The preparation of pot vines for fruiting during 1852 should at once be commenced; and if circumstances will admit of giving them 70 to 80 degrees of bottom heat, shake off the old soil, and replace them in same sized pots. But where no convenience of bottom heat exists, let them remain unpotted till once the roots and shoots are fairly in action, when they may be transferred into pots two sizes larger. For the first shift, use fibrous loam and leaf-mould in equal quantities; but for subsequent pottings, dispense with the leaf-mould and substitute well decomposed cow-dung, or hotbed manure, in about a third part. Introduce among the soil pieces of charcoal, or bones, to admit air, and produce a free discharge of water. Vine roots luxuriate in crevices. They deligh, to ramify in a moist atmosphere; but, in the least degreet saturation is a deadly enemy. If fruiting plants are required from eyes during the present year, put a single bud into a 32 or 48 sized pot, about half an inch deep, and plunge them into a bottom heat of 75 to 80 degrees, keeping the atmosphere not exceeding 50 degrees, and give no water before they begin to grow.

Peach House.—The expansion of the flowers has for some time past prevented the application of the syringe, which has given the green fly an opportunity of doubling its reproductive powers; and at no period can it commit greater havoc than just now, when the foliage is so tender. Its approach is not stealthy; it does not advance by the thousand, but in legions. We, however, possess the consolation that two weak doses of tobacco smoke will overcome it. The black aphis is more tenacious of life than the green one; but it seldom infests the peach house, as it has a greater predilection for cherry trees. Under the best management peach-trees do not maintain so robust a habit when forced as when grown in the open air, consequently every legitimate means should be applied to prevent, as far as possible, constitutional debility, the sustenance of which does not depend on the exercise of attention being directed to a few particular points, but a uniform adaptation of natural laws, modified so as to agree with their organic arrangement. There are, however, cardinal points which will not bear neglect, viz., disbudding, thinning of the fruit, and temperature. Disbudding should be done by degrees, so as not to check the returning sap: fewer shoots should be left on a sickly than a robust tree. Do nothing in a hap-hazard style. Every action must be directed towards the attainment of an object. Now is the time to preserve, or in a measure to restore, the symmetry of the tree, when we possess ample material. Thin the fruit when the size of marrow peas; but do not be too lavish: only remove them where set in clusters, as the crop is not yet by any means secure. The border may require water, but most probably no more than will moisten the surface, as the substratum cannot be dry, owing to the small amount of fire heat that has been used. The night temperature may range from 50 to 55 degrees, and admit a little air when the weather is mild. Begin a second house, and regulate operations according to details already given.

Cherry House.—Cherry forcing is by some persons considered critical, which is not really so. Very little skill is required beyond what is absolute for forcing peaches. More attention is required during the time of flowering, which is rather exciting, and a little neglect may prove ruinous. When the floral envelops begin to expand, reduce rather than advance the heat, and give all the air possible; for if by an incautious advance the calyx begins to fade before the pollen is matured, fecundation cannot take place, which inevitably destroys the crop beyond the least chance of restoration. Probably the trees will be in flower by the middle of the month: much will depend on the amount of sunshine; and, though possessing an exhilarating power foreign to any other kind of heat, its intensity should be modified by shading with some thin material. So soon as the flowers expand, discontinue the syringe, and keep the atmosphere dry, shake the trees gently once a-day, and impregnate with a camel-hair brush, the better to insure fructification.

Strawberries.—The Roseberry is a most excellent variety for early forcing: compared with Keen's Seedling and Alice Maud, it is by no means so profitable; the only value I attach to it is, that it flowers and fruits with freedom during the murky part of the year. It is with me (January 18th) setting fruit freely, and I cannot say that of the other varieties. Strawberry plants may, till they are in flower, be subjected to 60 degrees of heat, but should be removed to an atmosphere averaging from 50 to 55 degrees, till the fruit is formed, when they will be benefited by an advance of 10 or 15 degrees. Place the pots in saucers containing a little decayed manure to feed the roots, and remove small and deformed berries with a pair of grape scissors, and support the stalks to prevent the fruit from decay as they ripen. Maintain a moist atmosphere, and occasionally syringe the foliage. Forcing houses are not the place for forcing strawberries: the best place is pits, where they can be accommodated with a little bottom heat, and the plants removed only a few inches from the glass.

Cucumbers.—Those who have been able to preserve in a vigorous state the seedlings of last month should at once transfer them to the fruiting bed, but do not pinch off their points till they begin to grow. Whether the heat is supplied by hot water or fermenting dung, the consequence is now immaterial, as the year has shown its favourable side. I do not, at any period of the year, like the system of making solid dung-beds, more particularly at this fluctuating season. The disadvantages attending them are, that they at first produce a violent scorching heat, which before it has declined sufficiently to admit of planting, much time is consumed that often can ill be spared. In the case of chequered brick pits, it is preferable to erect a false bottom upon which to lay the soil, and maintain the heat by dung linings; or, if common wooden frames are employed, they may be placed on faggots; and if these cannot be provided, fix posts securely in the ground, on which to rest the frame. It is with considerable trouble and difficulty that a uniform heat can be produced in a solid dung-bed when the material has become rotten. Cucumbers flourish best in a soil of maiden character, mixed with a fourth part of leaf mould. Stimulating manures must be avoided; for, if the aliment is too abundant, foliage instead of fruit will be the product. The temperature may range from 70 to 80 degrees, accompanied by a proper degree of moisture.

Melons.—If ripe fruit are in request early in May, the seed should be sown at once; and to have them before that time is almost unnecessary, as there is not enough sun heat to give flavour.—A. C.—Gardeners' a Farmers' Journal.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEATH.
Day.	8-9a m	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	89a.m.	2 p.m.	10p.m.	
	in. cts.	in. cts.									
Dec. 21	30.26	30.23	26	38	38	South, var.	gentle	fine	sun	cloudy	rain
22	30.38	30.52	30	38	30	Variable	calm	haze	fine	haze	dry
23	30.50	30.52	30	38	31	Var., W. by S.	calm	fine	sun	haze	dry
24	30.44	30.18	31	36	36	S. by West	variab.	cloudy	cloudy	cloudy	dry
25	29.98	30.08	33	43	36	W. by North	gentle	fine	sun	cloudy	dry
26	30.19	30.19	33	43	43	S. Westerly	gentle	cloudy	cloudy	cloudy	rain
27	30.18	30.19	40	45	43	West	gentle	cloudy	sun	cloudy	dry
28	30.28	30.25	34	45	41	N. by W.	lively	fine	sun	fine	dry
29	30.29	30.10	35	46	46	West	lively	cloudy	cloudy	cloudy	dry
30	30.01	29.87	46	52	50	S. West	lively	fine	cloudy	cloudy	dry
31	29.88	29.75	45	52	52	S. West	brisk	cloudy	cloudy	cloudy	rain
Jan. 1	29.70	29.72	49	52	49	S. West	strong	cloudy	cloudy	cloudy	rain
2	29.70	29.80	47	52	48	S. West	high	cloudy	cloudy	fine	dry
3	29.97	29.86	46	47	47	Easterly	gentle	cloudy	cloudy	cloudy	rain
4	29.85	29.70	42	46	44	South	lively	fine	sun	fine	dry
5	29.57	29.54	—	46	39	S. by West	gentle	cloudy	sun	cloudy	dry
6	29.54	29.60	34	45	40	S. East	gentle	cloudy	sun	cloudy	dry
7	29.58	29.48	39	47	45	S. by East	gentle	cloudy	cloudy	cloudy	rain
8	29.48	29.40	39	49	44	South	id. bsk.	fine	sun	fine	rain
9	29.78	30.06	37	44	37	Westerly	gentle	fine	sun	fine	dry
10	30.00	30.07	37	50	50	South	gentle	cloudy	cloudy	cloudy	rain
11	30.14	30.10	47	49	48	S. West	variab.	cloudy	cloudy	cloudy	rain
12	30.00	29.99	48	50	49	S. West	lively	cloudy	cloudy	cloudy	rain
13	29.88	29.75	47	48	46	S. by W.	lively	cloudy	cloudy	cloudy	dry
14	29.60	29.30	44	47	44	S., S. by E.	lively	cloudy	fine	fine	dry
15	29.13	29.47	42	46	46	S. Westerly	brisk	cloudy	fine	fine	rain
16	29.75	29.50	41	47	47	South	strong	fine	fine	cloudy	rain
17	29.60	29.66	40	49	47	S. West	lively	fine	sun	cloudy	rain
18	29.90	30.12	34	47	39	W. by N., S.W.	gentle	fine	sun	fine	dry
19	30.11	29.99	40	48	42	South	lively	fine	sun	cloudy	dry
20	29.90	29.50	37	47	47	South	variab.	cloudy	cloudy	cloudy	rain

ESTIMATED AVERAGES OF JANUARY.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.77	28.89	52	11	30.1

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
46.2	39.1	42.65

WEATHER AND PHENOMENA.

Dec. 21—Keen white frost; changeable. 22—Calm and hazy. 23—Haze, damp. 24—Changeable; windy night. 25—Fine mild day. 26—Damp, overcast. 27—Superb afternoon; red sunset. 28—Very fine. 29—Overcast. 30—Fine sun-rise; changeable. 31—Wet noon; rising wind.

LUNATION.—Last quarter, 29th day, 9 h. 24 min. afternoon.

1851. January 1—Overcast; furious wind. 2—Wind very strong. 3—Miserable wet day. 4, 5—Clear and fine days. 6—Rather hazy; early rime. 7—Overcast, small rain. 8—generally fine. 9—Keen, bracing air. 10—Rainy forenoon, gloomy. 11—Some drizzle; very cloudy. 12—Same. 13—Overcast. 14—Lively air; fine day. 15—Wind, quick driving clouds. 16—Showers and wind. 17—Changeable. 18—Rain, snow in night, freezing on roofs; ground unfrozen. 19—Superb red clouds at sunset. 20—Gloomy, chilly, a little wet; stormy night

LUNATIONS.—New moon, 2nd day, 10h. 44m. morning. First quarter, 10th day, 4 h. 21 m. afternoon. Full moon, 17th day, 4h. 42m., morn.

REMARKS REFERRING TO AGRICULTURE.—The predominant high temperature—much above the average—has secured a beautiful plant of turnips; and sheep food is abundant. Crops in general are healthy, and we observe no marked luxuriance. The state of the ground is good also. Every article of food is abundant and cheap.

Croydon. J. TOWERS.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JANUARY.

During the greater portion of this month the weather has proved remarkably mild, the time of year considered; hence, in most parts of the country the wheat plants have progressed so rapidly as to make it necessary to feed off immense breadths of them. We may observe, however, that no fears are as yet entertained of the ultimate safety of the crop, though it cannot but be admitted that a few sharp frosts would be very beneficial. The comparatively high temperature has rendered it unnecessary for the graziers to make great inroads upon their stock of dry food, which is everywhere unusually abundant and cheap; whilst the losses from disease in the whole of our large districts have been trifling in extent. The continued heavy importations of foreign grain and flour, together with the large quantities of the former still on passage from the Levant, and the immense production of flour in France for shipment to the United Kingdom, have had a very depressing influence upon the corn trade. The extreme fineness of the French flour, and the low prices at which it has been disposed of, have rendered that article quite a favourite with our millers; hence, the actual sales of home-grown produce have been very small for some months past. We assume, therefore, after making due allowance for the falling off in the yield of last year's produce, and bearing in mind the supply left over from the crop of 1849, that the quantity of English wheat now on hand is a full average one; but it is evident that its quality is below that of ordinary years. In London, as well as at the large outports, the stocks in warehouse are heavy, and we see very little prospect of any material falling off in them between this and the opening of the navigation abroad in the spring. The predictions ventured upon by most free-traders, in respect to future prices, have up to the present time been falsified. Instead of wheat at 56s., we have it down to 38s. per qr.; and it is a matter of doubt in our minds whether the fall will rest here. It must be evident to all persons that the free admission of foreign produce has given a great and lasting stimulus to the agriculture of the Continent; a more striking proof of which could not be adduced than the fact that during the past year nearly half a million sacks of flour were received into the United Kingdom from France alone. In that country, we are credibly informed, agriculture is making immense strides, under, to an extent, the immediate auspices of the Government, as the millers there are now allowed to import foreign wheat and export it in the shape of flour, free of duty. It were hopeless, therefore, for us to indulge in anything like a favourable prospective glance; indeed, as we have already remarked, there is even now every reasonable possibility of further depressed rates.

The early lambing season has progressed remarkably well, owing to the mildness of the temperature. Up to the present time the fall has been a full average one. The large importations of foreign cattle, and the extensive supplies of both beasts and sheep forwarded to the various markets, have produced much inactivity in the demand; but prices have varied but little from those obtained in the previous month.

To some extent, the corn trade has been greatly influenced by the immense quantities of home-grown potatoes—almost wholly in good condition—which have come to hand in the metropolis. From abroad only about 800 tons reached us in the course of the month, yet prices declined fully 10s. per ton.

It will be recollected that during the whole of the latter part of last year we opposed the views of those who contended that a large portion of the potato crop had been lost by disease, and passing events have proved the accuracy of our statements. That the quantity produced in 1850 was larger must be evident when we assert that, notwithstanding the immense supplies which have already passed into consumption, the stocks now held by the principal growers are much larger than usual at this period. On the continent the produce appears to have exhibited a decided falling off, as the arrivals thence into London since the latter end of September have been 40,000 tons less than during corresponding periods in 1849 and 1850. From Ireland and Scotland we learn that a large quantity yet remains on hand, and that prices continue very low.

The depressed value of all agricultural produce has kept the linseed-cake market in a very dull state. The purchases are falling off almost daily; and it is evident that unless some change is speedily effected in our tariff laws many of the crushers will "go to the wall." No alteration has taken place in the value of linseed, but on many occasions it has been wholly nominal.

The importations of foreign grain, &c., into Ireland and Scotland having increased to some extent, the utmost caution has been manifested by the dealers in their operations. Prices have, therefore, ruled the turn in favour of the buyers, although the supplies held by them are unusually small. Somewhat large shipments of oats have been made to England, the returns upon which, after paying freight, &c., have been miserably small.

The only redeeming feature to which we have here to refer is the state of the wool trade. The large quantities of colonial wool disposed of last year for home use, as well as for exportation, reduced those in warehouse in December to under 8,000 bales. Since then we have had an import of about 10,000 packages—leaving us with a present stock of about 18,000 bales. There is, we find, a large quantity on passage from Australia; but the bulk of it cannot arrive hither before the middle of March. It is, therefore, doubtful whether any public sales will take place in February. In the mean time, consumption is going on at a rapid pace in the manufacturing districts; nearly the whole of last year's home clip has been worked up, and some of our flock-masters have already commenced shearing to supply the demand. The prospect of the market is certainly a most healthy one; and should our export trade continue as healthy as it is at present, it is very probable that wool will advance from 2d. to 4d. per lb. between this and the close of the year.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Since we last wrote, the metropolitan as well as the provincial cattle markets have been extremely well supplied with fat stock, both as to number and quality—a fact which strongly favours the assumption that we have an immense abundance in the country, and that we have no need of large importations to keep prices down to a moderate level. Throughout the month, the receipts of country-killed meat up to Newgate and Leadenhall have proved very extensive, and which, as a matter of course, have had considerable influence upon the demand in Smithfield. Both beasts and sheep have come to hand much riper, consequently more fit for consumption, than for many years past; and we may observe that the use of cake is evidently falling off on most farms. The value of the best Down sheep has, in some instances, advanced 2d. per 8lbs.; but no general improvevment has taken place in other kinds of meat.

The total supplies brought forward have been as under:—

	Head.
Beasts	18,310
Cows	361
Sheep	92,590
Calves	1,178
Pigs	2,998

CORRESPONDING PERIODS.

	Jan. 1847.	Jan. 1848.	Jan. 1849.	Jan. 1850.
Beasts	14,893	15,589	16,623	15,553
Cows	420	480	568	442
Sheep	94,680	61,880	93,150	95,560
Calves	842	770	873	1,014
Pigs	2,250	2,435	1,185	1,783

The average prices have ruled thus :—

Per 8 lbs. to sink the offals.

	s.	d.		s.	d.
Beef from	2	6	to	3	8
Mutton	3	4	to	4	4
Veal	3	0	to	3	10
Pork	2	10	to	4	0

CORRESPONDING PERIODS.

	Jan., 1847.						Jan., 1848.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, from	2	8	to	4	6	..	3	4	to	5	0
Mutton	3	8	to	5	2	..	3	8	to	5	4
Veal	4	0	to	5	0	..	4	4	to	5	6
Pork	3	8	to	5	0	..	3	8	to	5	2

	Jan., 1849.						Jan., 1850.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, from	3	0	to	4	0	..	2	10	to	4	0
Mutton	3	8	to	4	10	..	2	10	to	4	2
Veal	3	6	to	4	8	..	3	0	to	4	0
Pork	3	4	to	4	8	..	3	4	to	4	2

The annexed bullock supplies have been received:

	Head.
Norfolk, Suffolk, &c.	5,700
Northern districts	4,800
Other parts of England	1,800
Scotland	2,400

The imports from abroad into London have been :

	Head.
Beasts	1,411
Sheep	6,428
Calves	1,023
Pigs	156
Total	9,018
Same month in 1850	3,220
Same month in 1849	4,495
Same month in 1848	5,485

Very few arrivals have taken place at the outports; indeed, London now appears to be the great mart for foreign agricultural live produce. From the comparative statements given above, it will be perceived that a very great fall has taken place in the value of live stock within the last four years; nevertheless, the arrivals from abroad have continued steadily on the increase. Our letters from Holland and Denmark state that immense numbers of stock are still on hand, and that we may look for very extensive importations between this and the latter end of September.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF JANUARY.

The first month of the new year is drawing to a close, without having brought that improvement in the corn trade which many calculated on, indeed the tendency of prices has, on the whole, been downwards since the end of December, and the prospects for the future are not such as to hold out much encouragement to farmers. The imports of grain from abroad have continued on so liberal a scale as to counteract the effect which might otherwise have been produced on the markets by the falling off which has taken place in the deliveries from the growers. Stocks of foreign wheat and flour at the principal ports have rather increased than diminished, and are more than sufficient to furnish as much old wheat as is likely to be required during the interval which must elapse before the spring shipments from the Baltic and other northern ports can be expected to come forward. We shall, however, not be dependent on the granaried stocks for supplies, as large quantities of wheat and Indian corn are known to be on passage from the Mediterranean, the Black Sea, and the Sea of Azof; whilst consignments of flour from France to this country are still being made on as extensive a scale as at any previous period. Under these circumstances it would be vain to calculate on any material rise in the value of agricultural produce in this country, unless something unforeseen should occur to give an impetus to business.

From sources on which reliance may be placed, it appears that on the 31st December, 1850, there were on passage from, or loading at—

Odessa and the Sea of Azof	230	vessels.
Galatz and Ibraila	110	,,
Constantinople, Salonica, Malta, and Marseilles	65	,,
Egypt	25	,,
Italy..........................	30	,,
In all	460	vessels.

The cargoes of which are computed to consist of wheat 270 vessels, Indian corn 145, and the remaining 45 ships are loaded with linseed, beans, dari, &c. The total quantity of grain, &c., on passage from southern and eastern ports, on the 1st Jan., may therefore be estimated to have amounted to 800,000 to 900,000 qrs., and as the voyage would occupy from two to three months, the greater part, if not the whole, of that large supply has still to come forward.

The immense resources of Southern Russia, as a corn exporting country, are only beginning to develope themselves; that the cultivation of wheat will be enormously increased, whilst Great Britain affords a ready market for the produce, cannot be questioned; and we are fully convinced that the arrivals from that part of the world will augment from year to year, if we continue our present policy More than two years ago we stated that the effect of free trade would be to lower the average price of wheat in this country to 40s. per qr.; and though the last crop was decidedly short of an average, the imports have been so overwhelming that the value of the article has been reduced below that point, the present average for the kingdom being only 38s. per qr. The free-traders have for some time past acknowledged that so low a range of prices had not been anticipated by them, and have used all kinds of arguments to prove that foreigners would not consign to this country unless higher rates were obtainable. *The Economist* and other journals advocating the principles of free trade, entered into long statistical accounts to show that it would not pay the Russian, Prussian, and American growers to send wheat to Great Britain at 40s. per qr.; but the facts have wholly upset their theories, and in spite of drooping prices and discouraging accounts from Mark Lane, supplies continued to reach our shores from all quarters of the world. This point must, therefore, be considered as settled: two years' experience has afforded abundant data to come to a decided conclusion that the depression in the value of agricultural produce is permanent, and not temporary; indeed it may be fairly argued that the encouragement which the opening of our ports has given to agriculture abroad will have the effect of causing larger supplies to reach us year after year, so long as we continue a line of policy calculated to ruin our own farmers, and enrich those of other countries. We put this matter plainly, in order that farmers may not be deceived, and that in all future engagements they may enter into, they may do so with the perfect conviction that on the average of seasons they will not be enabled to obtain 5s. per bushel for their wheat.

The weather has throughout the month been unusually mild, and the fall of rain has been greater than is considered desirable in January; the improved drainage of the land has, however, the effect of carrying off the superfluous moisture much more rapidly than formerly, when this branch of husbandry was not so well attended to, and we do not therefore apprehend any evil from this cause.

The appearance of the young wheat plant is in general well spoken of, in some localities it is perhaps rather too luxuriant; but there are fewer complaints in this respect than from the character of the season might have been expected. The worse consequence of the mild damp weather, as far as the interest of farmers is concerned, is the very deteriorating effect which the humidity of the atmosphere has had on the condition of all kinds of grain of last year's growth. This has not only lessened the market value of their produce, but has greatly increased the difficulty of effecting sales, foreign corn having been taken in preference to that of home growth.

The almost total absence of frost, and the quantity of rain which has fallen, have likewise interfered with out-door work, the land having been rendered too wet to allow the carting of manure and other labours being completed in a satisfactory manner.

The general tone of the wheat trade has remained so nearly the same as it was when we last addressed our readers, that our remarks on this branch of our subject can hardly contain any new feature; we shall, however, proceed to give a retrospect of the transactions at Mark Lane during the month, which will suffice to afford a fair idea of what has occurred at the other large consuming towns.

The arrivals of wheat coastwise into the port of London have been decidedly small, having averaged only about 3,000 qrs. per week. The quantity brought forward by land-carriage samples from the home counties has been on the same moderate scale, so that there has been no pressure of English wheat on the market; and had the condition proved somewhat better, a small improvement in prices would probably have occurred; indeed, the best dry parcels have rather crept up in value, notwithstanding the extreme caution with which the principal millers have conducted their operations. The ordinary descriptions have sold at very irregular rates; but this does not warrant any alteration in quotations, for where lower terms have been accepted the millers have had no advantage, the intrinsic value having been quite as much less as the difference in price.

The receipts of wheat from abroad, though not particularly large, have been fair for the time of year—about 50,000 qrs. having arrived during the month. Of this supply only a very small proportion is from the Baltic. Some large cargoes have been received from Odessa, Barletta, &c., and the remainder has been chiefly from French and Belgian ports. Altogether we have had a good display of samples from on board ship, and importers have in general shown a disposition to accept rather lower terms for the fresh arrivals than holders of granaried samples have been willing to take. Really fine qualities of the latter, such as Danzig, Rostock, &c., have not been offered cheaper, and we consider prices of these sorts about the same as at this period last month; the demand has, however, at no period been active, the town millers having preferred working up their old stocks to making fresh purchases, and the country enquiry having been far from extensive. The fact is, that London now supplies a much narrower circuit of country than formerly, the provincial millers being enabled to draw their supplies from different points on the coast, without having to come to the metropolis for what they may require. The cheapest sales we have heard of during the month have been of some of the southern wheats. A cargo of very fine white Barletta, weighing, it was stated, 64lbs. per bushel, was disposed of at 41s. per qr., and good Polish Odessa on the spot has been sold at 35s. to 36s. per qr. in the river. These rates are relatively lower than those asked for Baltic wheat in granary, Danzig of moderate good quality having been held at 42s. to 44s., fine high-mixed at 46s. to 48s., and superior Rostock at 45s. to 47s. per qr. An arrival of a large fleet of vessels off the coast in the early part of the month, from Black Sea ports, caused floating cargoes of Polish Odessa to be offered at very low terms, and some sales were closed at 32s. 6d. to 33s. per qr., cost, freight, and insurance; subsequently, however, a rally took place, and the contracts closed during the last week have been at 34s. to 35s. per qr. The greater part of the vessels arrived off Falmouth have been ordered to different ports in Ireland, and there are now comparatively few cargoes undisposed of.

The nominal top price of town-manufactured flour has undergone no change. The sale has been considerably interfered with by the pressure of French on the market; but as the millers have not been able to buy good wheat lower than before, they have insisted on previous rates. The arrivals of country-made flour coastwise and per rail have been only moderate, and the value of the finer descriptions has been tolerably well supported. We have had regular supplies from France, and a few thousand barrels from America. Low qualities of French, having gone out of favour with many of our bakers, have hung very heavily on hand, and the tendency of prices has been downwards, but the best marks have commanded quite as much money as before—say 33s. to 35s. per sack. About the middle of the month, a parcel or two of American flour changed hands at 21s. per barrel, on speculation; since then higher rates have been demanded and obtained.

The arrivals of home-grown barley have not been large, and only a very small proportion of the supply has consisted of fine malting qualities. The best parcels have, therefore, commanded a ready sale, at full terms; and farmers have realized better prices for this grain, ever since harvest, than they have been enabled to obtain for their wheat. The reason for this is, that the foreign growth of barley is not liked by our maltsters, and that the home grower has therefore not been subjected to the same amount of competition in this article as that he has had to contend against in wheat. The culture of barley is, however, already receiving great attention abroad; and we have seen samples, the produce of Denmark, France, &c., which were little inferior to the growth of Norfolk. The top price for English Chevalier malting barley has remained steady since our last, at 30s. to 32s. per qr. Common malting and distilling sorts have moved off slowly, and at relatively lower rates, say 24s. to 26s. per qr. The arrivals of barley from abroad have been quite as large as usual at this period of the year; but we have had a fair inquiry for grinding sorts, and former terms have been well supported, the best heavy samples having been sold to a moderate extent at 22s. to 23s. per qr.

No change has occurred in the value of malt since the close of last month, if we except a slight improvement in the price of the best parcels of old. The brewers appear to be well stocked, and do not seem anxious to purchase more at present; sellers, on the other hand, manifest no particular desire to realize, and with a retail and somewhat dull trade, prices do not give way.

The market has been moderately supplied with oats of home-growth during the month; still this grain has been dull of sale, and former terms have barely been maintained. Towards the latter part of the past year there was a gradual improvement in prices, and the belief was general that during the winter months some difficulty would be experienced in obtaining adequate supplies to meet the demand. The extraordinary mildness of the season has, however, tended to upset this calculation, inasmuch as it has afforded facilities for drawing supplies from ports which in ordinary years would have been closed by ice, whilst the consumption has been materially lessened by the abundance of all kinds of green food for cattle. The actual fall in prices has not been important, but there has been so great a want of activity in the demand that where any anxiety to realize has been displayed, the purchaser has had a decided advantage. Scotch oats have been more pressingly offered than other sorts, and secondary qualities are not worth so much by fully 1s. per qr. as they were at the close of December. A large proportion of the foreign supply has been from France; the quality of the French oats is not much liked by our large dealers, and good black, weighing 37 to 38lbs. per bushel, have been placed with difficulty at 17s. to 17s. 6d. per qr. Importers will certainly not derive much advantage, as the prices paid free on board on the other side have been 13s. to 13s. 6d. per qr., and the expenses of freight and insurance may be taken at 3s. to 3s. 6d., which, with the duty of 1s. per qr., leaves no margin for profit. We are therefore inclined to think that the arrivals from thence will soon fall off; and as the Dutch and German ports were, according to the most recent reports, frozen up, we are still disposed to expect some little improvement in the value of good oats.

English Beans have come to hand rather freely, and the demand having been exceedingly slow, the tendency of prices has been downwards. The total decline during the month on soft new samples may be estimated at 1s. to 2s. per qr. The arrivals of foreign beans have been moderate, and Egyptian have sold in retail quantities at about former rates.

The very mild character of the winter has materially influenced the demand for peas, by lessening the consumption. Prices had, however, fallen so low at the end of January as to leave little room for further reduction; and neither white boilers nor hog peas have been sold cheaper since then, though the demand for both sorts has been tardy in the extreme.

The arrivals of Indian corn at the principal Irish ports have been liberal of late, and there has consequently been little disposition to purchase cargoes on passage. The transactions free on board have been comparatively unimportant this month, not only in London, but also at Liverpool, where this branch of business is more extensively entered into. The prices asked have been, for Galatz, 30s. to 31s. per qr., cost, freight, and insurance, whilst the offers have been 1s. to 2s. per qr. lower.

As it is important that the English farmer should be informed respecting the position of the corn markets abroad, we shall devote the remainder of our space to laying before our readers the substance of the latest foreign advices.

The weather appears to have been of a similar character over a large portion of continental Europe to that experienced in this country, and even at Danzig the frost was not sufficiently severe to interrupt the navigation, until about the middle of January. Very few shipments were, however, made from thence after the close of the year, and the transactions appear to have been altogether of but little importance, the prices asked by holders having been too high to encourage speculators to act. The latest accounts from thence are of the 20th inst., and state that hardly any contracts for spring delivery had been entered into, owing to the high pretensions of sellers, fine high mixed wheat in granany having been held at equal to 41s. to 44s., high mixed at 40s. to 41s., and mixed at 39s. to 40s. per qr., free on board in spring. The roads which had previously been almost impassable having improved since the frost had set in, the supplies from the farmers had increased, and the prevailing opinion was, that if no English orders were received, the prices would after a while settle down, so as to meet the state of affairs in this country.

At Konigsberg, on the 21st January, the wheat trade was heavy, and holders were disposed to make some concession, in order to facilitate business. The reduction had, however, hardly amounted to 1s. per qr., and, taking into account the difference in quality, quotations were relatively higher at that port than at Danzig. Supplies were then increasing, the frost having hardened the roads sufficiently to allow the surrounding farmers to bring their produce to market, which they had previously been unable to do. The shipments from Konigsberg during the year 1850 had amounted to 12,000 lasts of wheat, and the stock remaining on hand was estimated at 5,500 lasts. Quotations free on board, at first open water, were, for high mixed wheat 39s., mixed 36s. 9d., red 35s. 6d. per qr.

At Stettin, on the 20th inst., prices of wheat had a downward tendency; very good Uckermark and Pomeranian red, weighing 62lbs. per bushel, might then have been bought at 36s. 6d. to 37s. per qr. free on board in the spring. Other qualities had been offered at proportionate rates without exciting attention, and the operations had been altogether on a retail scale for some weeks previous. Barley having come forward sparingly had been held with firmness, the best descriptions not having been offered below 18s. to 18s. 6d. per qr. free on board in spring.

At most of the Lower Baltic ports the value of wheat began to recede more or less about the middle of the month, owing to increased supplies and a want of foreign demand for spring shipment. Very little frost was experienced until the 17th inst.; but for some days after, the cold was severe, and the harbours and rivers became covered with ice. The latest advices from Rostock, Stralsund, Anclam, Wismar, &c., state that holders of wheat had become much less sanguine, and that with positive orders on hand it would not have been difficult to have bought wheat of good quality, for spring delivery, at 36s. to 38s. per qr. free on board; but in the absence of anything like an active inquiry, quotations had become nearly nominal.

Our Hamburg letters are of the 24th inst.; the weather, which had been rather sharp the week before, was then mild; but there was so much drift-ice in the Elbe as to render the navigation difficult, hence little had for some days been shipped; and as there had been no inclination to buy for delivery in spring, the operations had been altogether on a retail scale. Good red Marks wheat, on the spot, weighing 61½lbs., had not been offered below 38s. 3d. to 39s. per qr. free on board. From outports there had been offers for shipment in spring at prices ranging from 34s. 6d. to 37s. per qr., according to weight, port of shipment, &c. In spring corn nothing of interest had transpired; for Saale barley, on the spot, weighing 49lbs., equal to 21s. 3d. to 21s. 9d. per qr. free on board had been asked. From the Danish islands 53lbs. barley had been offered for spring delivery at 17s. 3d. per qr. free on board, without meeting with much attention. Freight per steamer to London was 3s. to 3s. 6d., and to Hull 2s. per qr., and 10 per cent.

The accounts from Holland and Belgium are of nearly the same character as when we last addressed our readers, the supplies having been too moderate to cause much reduction in price, notwithstanding the want of an export demand. At Rotterdam, on the 24th inst., good red Rhine wheat, of 60 to 62lbs. weight, was quoted at 36s. to 38s.; and fine, weighing 63 to 63½lbs., 39s. to 40s. per qr. free on board. At Antwerp business was very quiet, but fine 62lbs. Louvain had not been offered lower than 40s., and the commoner kinds 36s. to 37s. per qr. free on board.

At many of the French markets prices of wheat and flour gave way in the early part of the month; and though holders afterwards showed rather more confidence, quotations are relatively lower in that country than with us, and consignments consequently continue to be made from Dunkirk, Havre, and other near ports, to Great Britain.

Owing to rather large supplies having been received at many of the markets in the Mediterranean, from the Black Sea and Sea of Azof, wheat had, it appears, suffered some decline. Letters from Marseilles, dated 23rd January, state that ordinary qualities, of 59 to 59½lbs. weight per bushel, had been offered at 24s. to 24s. 6d.; and good Polish Odessa, weighing 61 to 62lbs., at 30s. to 30s. 6d. per qr. free on board; the freight from thence to London being, however, 4s. per qr. consignments will not pay the importers, but this will not prevent shipments being made, and some quantity was being despatched to England.

The exports from Odessa, Galatz, and Ibraila, direct for Great Britain, had been very large in December, and the advices from those places confirm what we stated in the commencement of this article relative to the probable extent of the supplies from that part of the world.

The most recent accounts from America inform us of the close of the inland navigation by frost; and the previous shipments to Europe having diminished the stocks of bread-stuffs at the principal ports on the sea-board, holders of flour had been very unwilling to submit to any reduction. Our New York letters are of the 14th January. The transactions in flour for export had been comparatively unimportant since the commencement of the month; prices were then, for good shipping brands of Western Canal flour, 21s. 2d.; for pure Genessee, 21s. 9d. to 22s. 3d.; and for Canadian, 21s. 2d. to 21s. 9d. per brl., free on board. Freight to Liverpool was only 6d. per brl. The exports from New York, Boston, Philadelphia, Baltimore, and New Orleans, to Great Britain, from 1st Sept. to 31st. Dec., had been of

	1848.	1849.	1850.
Wheaten flour . brls.	676,009	186,453	571,761
Meal ....brls.	26,257	620	2,737
Wheat ......bush.	958,637	332,629	743,102
Corn ....bush.	3,725,955	717,932	219,957

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter				
WHEAT, Essex and Kent, white, new..	38	to 43	fine up to		49
Ditto ditto old ..	41	45	,,		49
Ditto ditto red, new....	36	41	,,		43
Ditto ditto old	39	41	,,		44
Norfolk, Lincoln, & Yorksh., red, n.	33	38	,,		41
Ditto ditto old..	39	41	,,		43
Ditto ditto white, new	39	41	,,		45
Ditto ditto old..	41	43	,,		45
BARLEY, malting, new..........................				23	25
Chevalier, new				30	31
Distilling, new				23	25
Grinding, old				21	23
MALT, Essex, Norfolk, and Suffolk, new	43	45	extra		47
Ditto ditto old	44	47	,,		49
Kingston, Ware, and town made, new	50	53	,,		55
Ditto ditto old	48	54	,,		56
OATS, English feed, new.............	16	18	fine		20
Potato, old	18	22	extra		23
Scotch feed, new	17	19	fine		20
Ditto, old....................	19	22	extra		23
Irish feed, white, new	16	18	fine		19
Ditto, old....................	20	21	extra		22
Ditto, black, new..............	15	17	fine		18
RYE	24	26	old	23	25
BEANS, Mazagan	25	26	,,	26	28
Ticks..........................	26	27	,,	28	30
Harrow..........................	26	28	,,	29	32
Pigeon	28	30	,,	30	33
PEAS, white boilers................	28	32	,,	28	30
Maple	29	30	,,	29	30
Grey	27	28	,,	27	29
FLOUR, town made, per sack of 280 lbs.	—	—	,,	35	40
Country marks..................	—	—	,,	28	32

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

	Wheat.		Barley.		Oats.		Rye.		Beans		Peas.	
WEEK ENDING:	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Dec. 14, 1850..	39	9	24	3	17	1	25	11	27	11	29	5
Dec. 21, 1850..	39	5	23	10	17	1	23	1	27	8	28	2
Dec. 28, 1850..	38	10	23	5	16	6	22	8	27	5	28	1
Jan. 4, 1851..	38	3	23	4	16	11	27	5	27	3	28	1
Jan. 11, 1851..	38	1	22	9	17	2	22	1	26	9	27	0
Jan. 18, 1851..	38	0	22	8	16	9	24	8	26	7	26	11
Aggregate average of last six weeks	38	9	23	4	16	11	24	3	27	3	27	11
Comparative avge. same time last year	39	10	26	1	15	9	23	6	27	0	28	7
DUTIES........	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's *Gazette.*	Qrs.	Av. s.	d.	Averages from the corresponding *Gazette* in 1850.	Qrs.	Av. s.	d.
Wheat ..	79,384 ..	38	0	Wheat ..	112,603 ..	41	0
Barley ..	95,594 ..	22	8	Barley ..	104,790 ..	26	3
Oats	22,468 ..	16	9	Oats	22,678 ..	16	0
Rye	57 ..	24	8	Rye	123 ..	23	9
Beans ..	5,672 ..	26	7	Beans	6,592 ..	26	6
Peas ..	1,421 ..	26	11	Peas	2,432 ..	27	6

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 54s. to 56s.; crushing 40s. to 42s.
Linseed Cakes (per 1,000 of 3 lbs. each) .. £8 0s. to £9 0s.
Cow Grass (nominal)........................—s. to —s.
Trefoil (per cwt.) ....14s. to 18s.
Rapeseed, (per last) new £25 to £27 ...... old £— to £—
Ditto Cake (per ton)..................£4 10s. to £4 15s.
Mustard (per bushel) white 5s. to 7s.; .. brown, 8s. to 10s.
Coriander (per cwt.)........................ 16s. to 24s.
Canary (per qr.).........new 46s. to 47s., fine 48s. to 50s.
Tares, Winter, per bush., 4s. 0d. to 4s. 6d.; Spring, nominal.
Carraway (per cwt.).......... new, 30s. to 32s.; fine 33s.
Turnip, white (per bush.) —s. to —s.; do. Swedish, —s. to —s.
Cloverseed, nominal.

HOP MARKETS.

BOROUGH, MONDAY, Jan. 27.

The improvement noticed in our last continues to be maintained, and the finer descriptions may be quoted a trifle dearer.

Sussex pockets..........	65s. to 78s.	per cwt.
Weald of Kents	72s. to 84s.	,,
Mid. and East Kent	84s. to 150s.	,,

WORCESTER, (Saturday last.)—There is a good deal of business doing, and prices are 2s. to 3s. higher than last week for fine Hops, with a good speculative demand for 1848, at prices varying from 28s. to 50s.

POTATO MARKETS.

SOUTHWARK, WATERSIDE, Jan. 27.

The arrivals the last week have been limited; but trade has been so heavy that we cannot note any improvement in prices except Scotch Regents, which are a little dearer: Cups are very bad to sell at any price. The following are this day's quotations:—

York Regents................	80s. to 100s. per ton.
Scotch	65s. to 80s.
Scotch Cups	60s. to 65s.
Cambridge and Lincolnshire Regents	70s. to 80s.
French whites................	50s. to 65s.

ENGLISH BUTTER MARKET.

MONDAY, Jan. 27.

We are without any change to note, but fine Butter is scarce, and sought after.

Dorset, fine	88s. to 94s.	per cwt.
Middling	70s. to 80s.	
Fresh	8s. to 13s.	per doz. lbs

WOOL MARKETS.

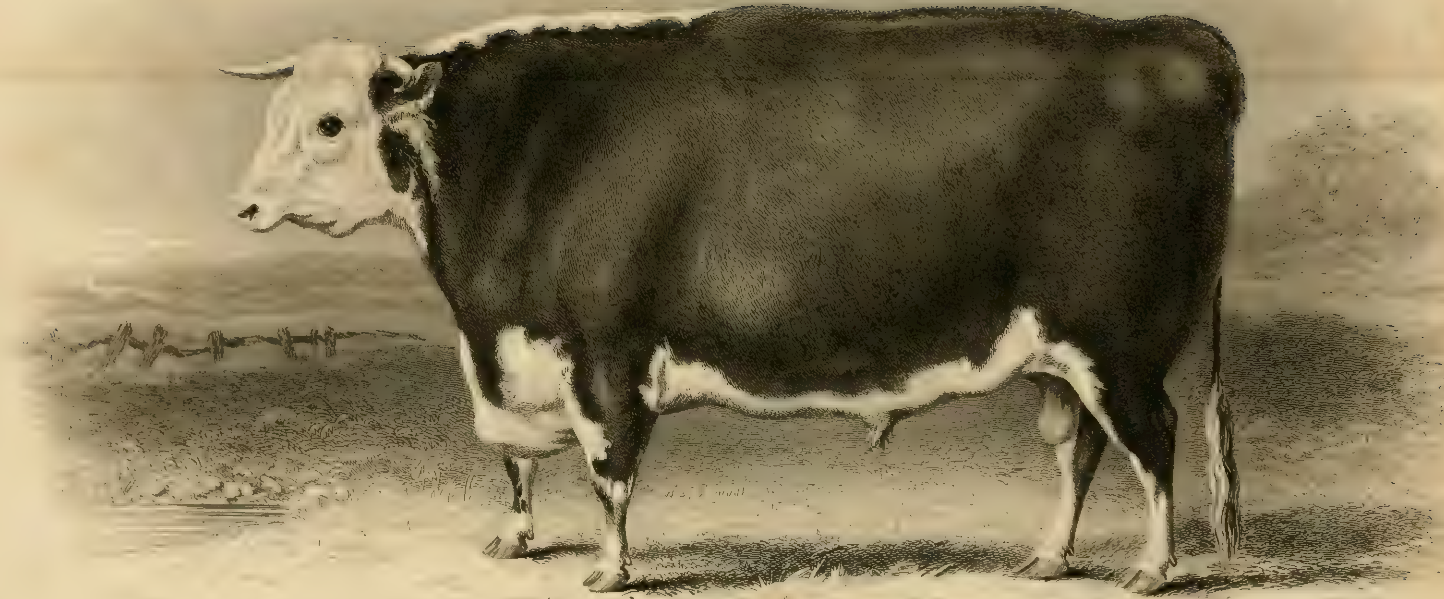
BRITISH WOOL.

LEEDS, Jan. 24.—There has not been any change of moment in the English wool trade during the present week. Sales have been to a moderate extent. Prices stationary.

LIVERPOOL, Jan. 24.

SCOTCH.—There is still little to report in Laid Highland, the stocks of which are not large, but sufficient for the demand. White Highland is rather more inquired for. In Crossed and Cheviot the demand is limited, and rates barely supported.

Printed by Joseph Rogerson, 24, Norfolk-street, Strand, London.



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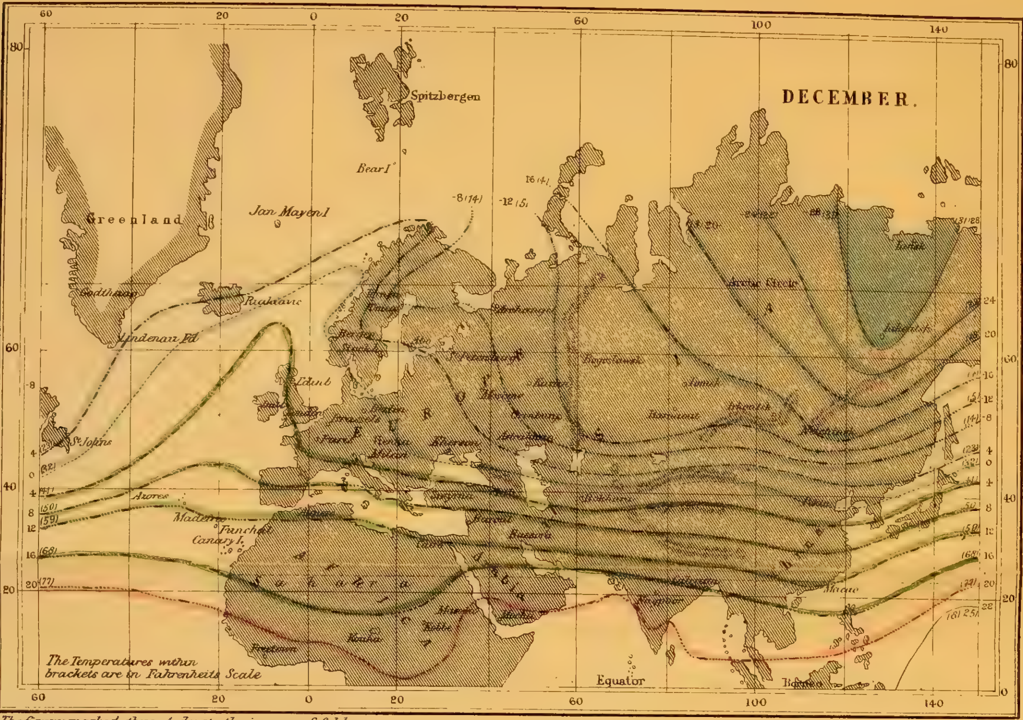
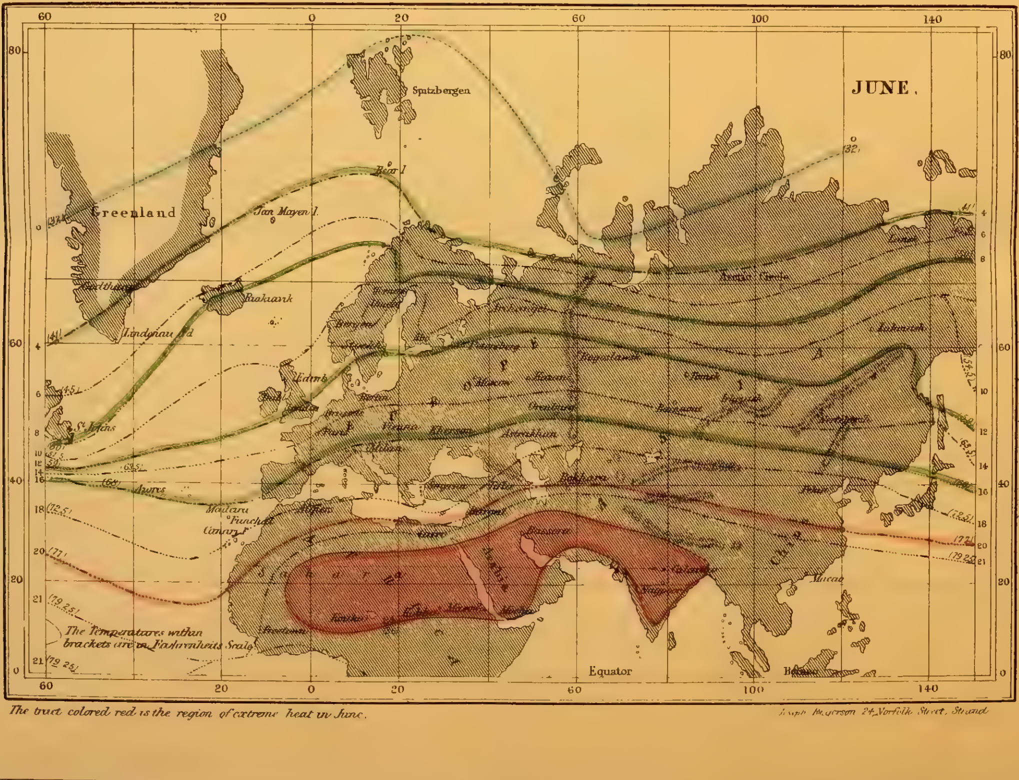


The figures marked thus -4 denote the increase of Cold.
The tract colored pale blue in Siberia is the region of extreme cold in December.



The tract colored red is the region of extreme heat in June.

Joseph Emerson 24 Norfolk Street, Strand.

THE FARMER'S MAGAZINE.

MARCH, 1851.

No. 3.—Vol. XXIII.] [Second Series.

PLATE I.

A HEREFORD BULL.

The subject of our first plate, a Hereford Bull, the property of Mr. John Monkhouse, of the Stow, Herefordshire, obtained the first prize of Forty Sovereigns at the Royal Agricultural Society's Show at Exeter, in July, 1850.

PLATES II. and III.

Extracts from Professor Dove's Chart, showing the lines of cold and heat on the surface of the earth, and how they affect England, referred to in Mr. Pusey's paper "On the Progress of Agricultural Knowledge during the last eight years," see the 214th page of this number.

DOMESTIC AND CULTURAL ECONOMY.

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON.

No. XI.

As facts come to light they demand corresponding attention; and, therefore, the effectual preparation of the land must be strenuously urged before we enter minutely upon the cultivation of plants, which are expected to be produced of a quality remunerative of the outlay incurred. The character of the land everywhere ought to approach, as nearly as possible, to that of a soft unctuous loam, of which the constituents are a predominant quantity of finely divided sand (silex); a less but considerable proportion of clay (alumina); of chalk (carbonate of lime), from 2 to 10 per cent.; and of oxide of iron, sufficient to impart the several tints, varying from a drab to a full ochreous brown, or even dark maroon red. If a handful of soil, just so moist as to leave a spade free from clod while it is dug, be taken up, and compressed firmly—*retain its shape* till it fall to the ground from the height of about five feet, but then *break and disperse itself* on the firm surface—a fair opinion may be formed of its general excellence. If, on the contrary, the mass retain its figure, some meliorator is required, and *that* will be found in the ashes of free-burning sea-coal. Of this I had ocular assurance when inspecting a property of many acres at Taplow, in Buckinghamshire. The natural soil was so aluminous and clodding, that little could be done with it. Sharp, gritty sand appeared (as is always the case) to render it more obstinately binding; but a deep coating of coal-ashes, thoroughly incorporated, proved a complete and permanent remedy, as the experience of 20 years had shown. *Clay* or *marl*, on the contrary, is the remedy of over-light and sandy earths. The examination of soils by pulverization and repeated washings with water, if patiently conducted, will prove the correctness of the foregoing assertions, and afford tolerably correct indications of the quantity of the several constituents in a soil. As to *chemical tests*, with the single exception of a little strong *muriatic acid*, added drop by drop upon a portion of wet earth in a watch glass, they are not available to ordinary cultivators. But the acid test *is* decisive in so much, that if any chalk be present, a frothy beading will, to some extent, be perceived wherever a drop falls upon the moist earth.

Burnt clay is a capital meliorator. It was much used, some years since, at Welbeck, when Mr. John Mearns was head gardener to the Duke of Portland, and was strongly recommended by Mr. Stafford, gardener to the late R. Arkwright, Esq., Willersley Castle, in an article addressed to *Messrs. Paxton* (the now far-famed inventor of the Crystal Palace) *and Harrison,* then editors of the "Horticultural

Register." I regret that I must abbreviate; but the following lines comprise the substance of a process which is worthy of adoption by every manager of heavy clay land, whether in the British Isles, or in some remote colony.

Mr. Stafford asserts that "it had fallen to his lot to operate on clay twenty-two years out of forty-eight. Although the garden had been formed twenty-five years, with most excellent judgment, it was, for the most part, a strong clay; and within nine inches of the surface, even the most common articles would not live upon it."

Now, as to the process of burning:—"I throw out a trench eight feet wide, three feet deep; into this I place as much small wood or faggots as will fill the trench to the ground level; upon these a quantity of old tree roots, or stronger wood, so much as required by the bulk of clay to be burnt. Taking advantage of fine weather, the fire is lighted. When this is done, the whole is covered up with that clay, which, coming out last from the trench, is the strongest; and as the fire advances, more is thrown on the heap, making an embankment with the top soil, and all that part which contains any vegetable matter. As the fire increases, the clay contiguous to the fire is dug up and thrown on the top; and should the weather be dry there will seldom be any addition of fuel required. The violent heat subsiding, the bulk is spread out, which, from the *carbonaceous principles* received in the process, is fully equal to soot. The fire may require some probing, just to admit some air; but I never wish to see much *smoke* escaping, as that contributes much to enrich the clay. When the whole mass of wood has been consumed, the body of clay will have fallen to the bottom. To secure success I level down the heap, taking care not to break or pulverize the compost—the more this is avoided, the longer it will retain its fertilizing qualities."

Now, as to *those*, a few lines will suffice. I knew Mr. Stafford, and his frank truthfulness. From his remarks, and Mr. Mearn's experience, I collect the following particulars:—

"Ground so treated will require no manure, for at least four or five years, as every species of vegetable appears to grow much too strong for the first two years." The reader should now recur to the discoveries made and announced by Mr. Jasper Rogers, of the immense value of Irish bog peat, when properly carbonised, but not burnt to an ash. Science has greatly extended our knowledge of the properties of carbonised matters, and it will be the fault of cultivators if they do not bring the subject to the test on their broad lands.

"Burning clay entirely destroys every species of insect and pernicious weed; and on whole quarters where the process was performed years ago, I have scarcely observed either slug or snail. I make it a rule never to burn more clay on a given quarter than the space requires to correct the soil, as it would be a waste of labour to remove it from place to place" ("Hort. Register," vol. i. p. 216).

Mr. Mearns found his stiff land to be effectually improved in texture by an ample dressing of burnt clay, and that insects were banished from the plots or borders. As to the quantity required, Mr. Stafford suggests *one-third part* of his carbonaceous clay for the melioration of a vine border. But the quantity must vary according to the character of the earth in each individual locality. Clay, if it do not contain vegetable matter, loses its texture by burning, is to a certain extent reduced to little better than masses of brick, and when broken up loses its tenacity, it then acts mechanically, but confers no fertilizing qualities. So far the process adopted by Mr. Mearns differed from the one recommended by Mr. Stafford, who had a twofold object in view, as the reader must have discovered. Connected with deep tillage, which the operation implies, is the completion of a perfect system of drainage, which, though it be carried out at once in all its details, ought to be prepared for by the process of *tapping*, if it appear that any true *spring* exist in the property. Experience has shown that drains in stiff soils may have been well laid at even the depth of four feet, and yet have failed to carry off the surface-supply of water, in consequence of the *rise* of some unsuspected spring. A channel should, in such case, be excavated far below the drains, and be so situated as to carry away the spring water, which otherwise might ascend, and swamp the soil far above the level of the acting drains.

After what has been discovered of late, by unerring chemical investigation, and made public in many periodicals, I hope it is scarcely needful to re-urge and impress the great facts, that loamy soils retain manures which cannot be washed out of them by continuous rain, and that the water which percolates the soil from above, and passes away through the drains, carries off with it *lime* held in solution by some acids. Further experiments with every kind of earth, combined with liquid and solid manures, are required to interpret the causes of phenomena that have been recently brought to light. I would recommend that solutions of guano of various qualities and strength, be passed through a drainer of loamy earth. Such experiments made carefully, by competent persons, might elicit startling phenomena. I know that by repeated trials with one specimen of guano in water, which contained no traceable cretaceous matter, I obtained so large a quantity of *lime salts* in the filtrated liquid that had passed through seven or eight inches of light loamy earth, as to perplex and surprise me.

THE OAT CROP.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

A few facts relating to this great crop will, now at its seed time, be perhaps useful to many of my readers. Let us then enquire what has recently been reported in illustration of—1st, the chemical composition of the plant; 2ndly, the choice of seed; and 3rdly, its top-dressings.

Its chemical composition is thus practically given by Professors Way and Ogston (*Jour. Roy. Ag. Soc.*, vol. xi. p. 501). The following quantities, they remark, of different mineral matters, are taken up by a fair crop of oats, the straw being supposed to be about half as much again in weight as the grains. Forty-eight bushels of oats, at 42lbs. to the bushel, will weigh 2,016 lbs., containing 60·5 lbs. of ash; 3,024 lbs. of straw and chaff will contain 138·4 lbs. of ash. The mineral matter removed from an acre of land by a crop of oats will then be

	In the Grain.	Straw.	Whole Crop.
Silica	27·2	69·6	96·8
Phosphoric acid. .	15·2	7·1	22·3
Sulphuric acid . .	1·1	4·7	5·8
Lime	2·2	9·8	12·0
Magnesia	3·8	5·3	9·1
Peroxide of iron .	0·6	2·1	2·7
Potash	9·2	27·3	36·5
Soda	0.9	2·7	3·6
Chloride of Potassium	0·0	3·8	3·8
Common salt....	0·3	6·0	6·3
	60·5	138·4	198·9

The reader, who will refer to the first report on ashes (*ibid*, vol. vii., p. 593), by these distinguished chemists, will find, as they remark, that the *exhausting* character of oats, (if, indeed, exhaustion is connected with mineral composition at all,) is but little different from that of wheat.

The next branch of our present inquiry, the choice of seed, is one well worthy of the patient attention of every landholder. This is a much more important affair than is always well understood. In the determination of such trials as are instituted to determine this, the degree of ripeness which the oat plant should be allowed to attain previous to cutting is a very important consideration. On this subject, the observations of Mr. Alexander Murray, of Cruden, in Aberdeenshire, are valuable; for he entered, he tells us, upon the inquiry (*Trans. High. Soc.*, 1847, p. 623), first with the view to discover from certain appearances how the stages to maturity might be recognised upon examination of the stems and leaves; and secondly, to ascertain the difference in the samples reaped at these stages towards maturity. To accomplish this, in the first instance he selected specimens of stems from the early English or barley oat, growing on similar quality of soil. After a careful examination of many such specimens at and posterior to the time in which the milky state of the ear had become hard, yeilding very light grain, "I was agreeably surprised to find," Mr. Murray adds, "that *six* stages to maturity might be readily discriminated; and that the sample afforded at each stage was of uniform ripeness, and might easily be distinguished from any of the others in respect of maturity. The *first* stage I fixed upon was when the leaf, situate immediately below the lowest or third joint of the stem, and fourth leaf counting downwards from the ear, had assumed a yellow hue, while those above it were yet green. The *second* stage was when the third leaf below the second joint became yellow, and the one above it continued green. The *third* stage, when the second leaf below the first joint was yellow, and the one above it continued green. The *fourth* stage, when the first leaf, situate between the ear and the first joint, became yellow. The *fifth* stage, when the parts where the branches of the panicles join the stem were alone green. And the *sixth*, when the greenness had entirely disappeared." Mr. Murray next found that the samples of grain produced at the above six stages were easily distinguished from each other by appearance and quality. When submitted to competent judges, they were able at once to arrange them in their proper order; and they agreed that there was a difference in weight of 1½ to 2 lbs. per bushel between the samples produced at the *fifth* and *sixth* stages. The general choice of the best stage of ripeness for the cutting of wheat is of very considerable advantage in a national point of view; since a very small general gain in the weight of the sample makes an enormous difference, when we remember the large extent of land devoted to the production of oats. The growth of oats we all know gradually increases in extent, almost from the southern to the northern portion of our island. In Scotland, indeed, it has been calculated that about one-half of the arable soils are devoted to the growth of oats. Or assuming that the arable land of Scotland is equal in extent to about

2,400,000 acres; then it has been calculated that these are thus distributed—

	Acres.
In Oats	1,275,000
„ Barley	280,000
„ Wheat	220,000
„ Beans and Peas	100,000
„ Potatoes	130,000
„ Turnips	350,000
„ Flax	16,000
„ Gardens	32,000

In the choice of seed, as I on a former occasion remarked, it is not only the quality of the seed but the variety which is to be regarded. And there are several other very important points which must not be forgotten. The question is naturally, from the great extent of the crop, much more generally regarded in Scotland than in England. In that country it has long been determined that such inquiries are fraught with useful instruction, although it is certain that the results of these must not be regarded as certain foundations for obtaining a crop; for as Mr. Finnie, of Swanston, observed (*Trans. High. Soc.*, 1850, p. 313), "It may appear to some no very difficult matter to make a selection so as to meet the case of every field on a farm; but we, practical farmers, find that the earliness or lateness of the seedtime—the earliness or lateness of the time at which the land has been ploughed, and which is in a great measure regulated by the nature of the winter—the dryness or wetness of the weather at seedtime—the general character of the summer—the earliness or lateness of the harvest—the weather which then prevails—and the very changing of the seed, often produces results the very contrary of what occurred in previous seasons. Still, however, good general principles may be established. Thus, in the selection of seed oats, Mr. Finnie thinks that three divisions may be arranged, and that these may include, *first*, the best variety of oats to sow where the land has every advantage from climate; *secondly*, where the climate happens to be rather of a medium character; and *thirdly*, where from altitude, great risk exists of not having the crop matured in even the most favourable seasons. In addressing myself to the first of these heads, I might say that on the first class land the potato oat has been found, generally speaking, the most remunerative. It is no doubt true that the oat has likewise its drawbacks; sometimes it suffers from tulip-rooting: it sheds its seeds very early, and consequently there is much loss in both reaping and stacking. By cutting it a little quick, the latter evil may, to a certain extent, be avoided; but where the former is found to prevail, I should be disposed either to substitute the Hopetoun, or sow a mixture of potato and Hopetoun, in the proportion of one-half. I am inclined to think that tulip-rooting is often occasioned by the land being ploughed too wet. In the event, however, of this class of land being rather soft, and the potato, when tried, liable to lodge, which it very readily does, I would substitute the Berlie. We have likewise the early Angus and the Sandy. I prefer the Berlie, as it stands up better, and has fewer green prickles in the sample than the Early Angus, and is a more prolific variety than the Sandy. The Black Tartarian is very suitable for this description of land; but from its colour it is not so marketable. Mr. Sherriff, to whom we are indebted for the Hopetoun, lately introduced an oat, which he named the Sherriff oat: it is an early variety, and not liable to lodge. On the second class land, under this division, I would prefer the later varieties, such as the Grey Angus, the Late Angus, and the Hopetoun. The Grey Angus gives, on an average of Scotch seasons, excellent produce and good quality of straw. I would prefer, however, continues Mr. Finnie, to adopt a mixture, and for this purpose would select the Hopetoun with the Birlie, or the Early Angus, or the Sandy, or Kildrummie, and these in the order I have named as the land declines in fertility. The Hopetoun may be mixed with any of these in the proportion of two of Hopetoun to one of the kind selected, or in even five of the Hopetoun to one. For many years, on the best managed farms in East Lothian, it was customary to sow a mixture of potato and Early Angus. The Hopetoun, however, is better adapted for such a purpose, because it is more suitable for the land under consideration, and because it does not tiller out like the Potato oat. The crop, in consequence, is not so liable to become too thick. It is a tall-growing oat, and thus shades and retards the ripening of the Early Angus, Berlie, or Sandy, which are rather earlier varieties; and besides, as the Hopetoun should be cut before being quite ripe, the whole admits of being reaped advantageously at one time. I should, therefore, conclude that if a mixture is preferred, the Hopetoun and Berlie is most suitable. If, on the other hand, pure seed is sown, I would fix upon the Hopetoun for what the farmer calls soft clay land—the Grey Angus for hard clay land. On those soils where the climate is of a medium character, the Hopetoun Mr. Finnie deems the best for the superior soils, or a mixture of the Hopetoun and the Potato. On those soils, however, where the crop is apt to lodge, the Berlie, Early Angus, or Sandy would be a better substitute. For the secondary description of soils in this division, there is the Early Blainsie, the Kildrummie, the Hopetoun, and the Dun oat. This last, it seems, stands unfavourable changes in the weather better than any other kind of oat cultivated in Scotland; its straw, however, seems not to be of the finest quality. But after all, as Mr. Finnie well concludes, the only way in which a farmer can arrive at the varieties of oats the most profitable for him to sow, is, for a series of years, to test on his own farm the results obtained by comparative trial of the different kinds, both separately and in mixture, and then judge from an average of years what is likely to prove most remunerative. From *one* of a series of trials made with the view of ascertaining what I ought to sow on the lowest and best land of my farm, the following results were obtained. The same extent of land produced these quantities of oats. (A boll is equal to four bushels.)

	Bolls.	Bush.
From Potato alone	12	2
„ Hopetoun do.	10	5
„ Early Angus do.	12	5
„ Kildrummie do.	12	5
„ Dun oat do.	12	4
„ Blainsie do.	11	4
„ Grey Angus do.	10	3
„ Sandy do. (changed seed)	10	1
„ Sandy do. (unchanged seed)	9	2

From Mixed Seed.

	Bolls.	Bush.
Hopetoun 5, Kildrummie 1 parts	14	1
Hopetoun 5, Sandy 1 do.	13	2
Hopetoun 5, Early Angus 1 do.	12	4
Potato 5, Early Angus 1 do.	11	0
Potato 5, Sandy 1 do.	11	0

The very material difference in the results thus obtained by using different varieties of seed oat, unmixed and mixed together, will not escape the serious attention of the English farmer. And the same question presents itself in the case of wheat, barley, and other seed crops. The question is one that every farmer must expect to decide by patient experiment and careful observations: there are, however, we have seen, certain general principles which will hardly need much examination in any district. Of these, the advantage of a judicious *admixture* of seed seems to be undoubted; and there are other pretty well-established points in the same important inquiry to which I shall hereafter, as wheat seed-time approaches, direct the attention of the readers of the magazine. For the reasons to which I have before alluded, the greater number of trials with various manures on oats have been made in Scotland.

In some numerous trials made by Mr. A. F. Gardner, at Barrochan, in Renfrewshire, upon the effect of various top-dressings with oats, the following are a few only of the reported results, the soil being a moss from eight to twelve inches deep (*Trans. High. Soc.* 1847, p. 34)—

				Produce per acre.	
				qrs.	bush.
1. The soil simple				5	7
2. Silicate of soda,	2	cwt.	at 12s.	6	1
8. Silicate of soda,	1	„	at 15s.	7	7
Guano,	1	„	at 10s.		
9. Peruvian guano,	1	„	at 10s.	8	1
Silicate of soda,	1	„	at 12s.		
Common salt,	1	„	at 1s.		
Kelp,	1	„	at 5s.		

The following series of experiments was made at Lennox-Love, at the request of Lord Blantyre; the general object being to ascertain the relative effect of different saline substances applied as top-dressings upon young plants.

Oats, second crop, after old lea. Soil, sharp loam; subsoil, clay, resting on sand-stone rock. Oats sown 14th March; top-dressings applied 13th May; crop cut 27th August; and thrashed 9th Sept. The quantity of land in each plot was one-eighth of an imperial acre.

Dressing applied.	Manures.		Weight, as taken from thrashing mill, of		
	In lbs.	Cost. s. d.	Dressed grain. lbs.	Grey or seconds. lbs.	Straw. lbs.
Soil simple	—	—	264	8	362
Common salt	14	0 4	239	13	323
Common salt	7	7 4	236	24	328
Rape-dust	112				
Nitrate of soda	14	3 1	205	21	276
Nitrate of soda	7	8 7	231	17	296
Rape-dust	112				
Nitrate of soda	7	2 0	187	12½	266
Sulphate of soda	7				
Sulphate of soda	14	1 0	188	11	249
Sulphate of soda	7	7 5	263	20	355
Rape-dust	112				
Rape-dust	224	14 0	224	26	324
Guano	28	5 0	351	30	496
Soot	4 bsh.	4 0	193	11	269
Waste water from gas work, diluted with four times its bulk of water	6 gls.	—	273	15	390

The result of such practical inquiries will always be gladly received by the English farmer. They can be studied and varied as differing soils and situations suggest. They all tend, however, to one great end —the increase of agricultural knowledge; and they form stepping stones to still higher, and I trust, more remunerative advances.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held at the Society's House in Hanover-square, on Wednesday, the 5th of February; present, his Grace the Duke of Richmond, K.G., President, in the chair; Lord Camoys, Lord Southampton, Lord Feversham, Lord Ashburton, Lord Portman, Hon. Robert Henry Clive, M.P., Hon. Dudley Pelham, M.P., Hon. Henry William Wilson, Sir Thomas Dyke Acland, Bart., M.P., Sir Robert Price, Bart., M.P., Colonel Austen, Mr. Raymond Barker, Mr. Barnett, Mr. S. Bennett, Mr. Bramston, M.P., Mr. Brandreth, Mr. Burke, Colonel Challoner, Mr. Evelyn Denison, M.P., Mr. Druce, Mr. Foley, M.P., Mr. Garrett, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Fisher Hobbs, Mr. Hudson (Castleacre), Mr. Jonas, Mr. Kinder, Mr. Miles, M.P. (Leigh Court), Mr. Milward, Mr. Pusey, M.P., Prof. Sewell, Mr. Shaw (London), Mr. Shaw (Northampton), Mr. Villiers Shelley, Prof. Simonds, Mr. Slaney, M.P., Mr. Stansfield, M.P., Mr. Thompson (Moat Hall), Mr. C. Hampden Turner, Mr. Villebois, Prof. Way, Mr. Jonas Webb, and Mr. Wilson (Stowlangtoft).

Sir Francis Lawley.—The Council received with a deep feeling of regret the announcement of the death of Sir Francis Lawley, Bart., of Middleton Hall, Warwickshire, one of the members of the Council in the class of Trustees, and an original Life-Governor of the Society, who, preferring the hereditary rank of his ancient family, as one of the oldest baronets of the United Kingdom, to the honours of the peerage, which were offered for his acceptance, devoted his time and means to the happiness of all around him. He was indeed, in the highest sense, a truly English country gentleman, whose name and memory will be long cherished with affection by the wide circle of his friends, and the results of whose benevolent consideration will be long felt by the tenantry on his estates, who were more immediately within the sphere of his influence, and by the "poor and needy" of every class, to whom he ever proved so great a blessing.

Finances.—The current cash balance in the hands of the bankers on the last day of the month then just ended was found to be £2,177.

Nomination of Judges.—Lord Portman, as Chairman of the Judges' Committee, presented to the Council the following report, which was unanimously adopted:

The Committee beg to recommend to the Council the adoption of the following course, to be pursued in future for the nomination and selection of the Judges of Implements and of Stock at the Country Meetings of the Society, namely—

1. That prior to the Monthly Meeting of the Council in May, the Secretary shall write to each of the Judges who have acted in the three preceding years, asking whether he is willing to allow himself to be again put in nomination; and if so, for what description of stock or class of implements he would be ready to act, if he should be appointed by the Council.

2. That the members of the Society will materially aid the Council, if they will exercise their privilege of forwarding to the Secretary, before the 1st of May in each year, the names of such parties, willing to act, as they would recommend to fill the office of Judges, stating the particular kind of implements or description of stock for which their experience would render their services most likely to be useful to the Society.

3. That the Secretary, immediately after the 1st of May, should form a schedule of the names of persons so obtained, and supply each member of the commitee of selection with a copy thereof as soon as possible after their appointment.

4. That the Committee, or Committees, appointed by the Council in May, for the selection and recommendation of fit persons to be appointed Judges at the ensuing Country Meeting of the Society, should consist of not less than 10 members each, of which the quorum for business should be five. (Signed) PORTMAN, Chairman.

Veterinary Science.—Lord Portman, having laid before the Council the following Report, which was unanimously adopted, gave notice that at the next Monthly Council he should move that the annual grant of £200 should be made to the Royal Veterinary College, as proposed by the Committee:—

The Committee, appointed to confer with a Deputation from the Royal Veterinary College, beg to report to the Council the result of that Conference: namely—

1. That, on July 10th, 1839, the Royal Agricultural Society of England made a communication to the Royal Veterinary College, inviting their co-operation, and requesting them to turn their attention to the diseases of cattle, sheep, and pigs; and they voted to the College the sum of £200 per annum, as a contribution towards the additional expenses to which the Royal Veterinary College would be subjected.

2. That the Royal Veterinary College readily responded to this appeal, and expended a considerable sum of money in building sheds, &c.; and appointed a professor to attend to this department, at a cost to the Royal Veterinary College of about £400 a-year.

3. That since that time the pupils in the College have received instruction in these branches, namely, in the pathology of cattle, sheep, and pigs; and a body of young men, thus instructed, have been spread over the country.

4. That the Royal Veterinary College, during the suspension of the grant, have continued for the last two years the same course of instruction, and the same expenditure, and in addition have paid to Professor Simonds £50 for lectures given to the Royal Agricultural Society of England.

5. That the Committee, after a full consideration of the question, are unanimously of opinion, that the best mode of expending the sum of £200 per annum, devoted by the Council of the Royal Agricultural Society of England to the improvement of Veterinary Science, is, to renew the annual grant to the Royal Veterinary College.

6. The Committee propose, however, that the renewal of the grant should be accompanied by the following conditions: namely—

(1.) That the Royal Veterinary College make a report annually of their proceedings in these particulars to the Royal Agricultural Society of England.

(2.) That the Royal Veterinary College admit to the Members of the Royal Agricultural Society of England the privilege of sending to the Royal Veterinary College, Cattle, Sheep, and Pigs, on the same terms as if they were subscribers to the Royal Veterinary College.

(Signed) PORTMAN, Chairman.

Show of 1851.—Lord Portman then laid before the Council the report of the General London Committee, along with the "conditions" transmitted to him by Lord Seymour, her Majesty's Chief Commissioner of Woods and Forests, and a letter from Lord John Russell, First Lord of her Majesty's treasury, communicating to Lord Portman his own views, as well as those of the Duke of Wellington, Commander-in-Chief and Ranger of Hyde Park, in reference to the show of live stock which the Society had been invited to hold in Hyde Park during the present year. This report, which, on the motion of Lord Feversham, seconded by Mr. Miles, M.P., was unanimously adopted by the Council, recommended in the most decisive terms that the Council, acting on the part of the Royal Agricultural Society of England, should not consent to the "conditions" proposed for their acceptance by the Office of Woods and Forests; but, on the contrary, that they should request the Duke of Richmond, as their President, to wait upon Lord John Russell, agreeably with his lordship's expressed willingness to promote the objects of the Society, and to confer with him on the site most suitable for the purposes of the Society's show of stock, in order that her Majesty's pleasure may be taken on the subject.

The Duke of Richmond intimated his intention to take the earliest opportunity, consistent with the convenience of members, to hold a special Council for further decision on this important subject; to which occasion, also, it would be desirable to refer the conditions and regulations of the Society's Prize Sheet for 1851.

Flax-Cotton.—Mr. Pusey, M.P., gave notice that M. Claussen would attend at the Weekly Council on Wednesday next, for the purpose of showing specimens of the new mode of preparing flax for its conversion into flax-cotton, and of giving to the members some account of the process.

Exeter Meeting.—Mr. Spreat, of Exeter, presented to the Council a first-class coloured print of his view of the Fore-street in that City, on the occasion of the Society's Country Meeting in 1850, and of the decorations of the city on the occasion; dedicated, by special permission, to Her Most Gracious Majesty the Queen, for which, and other presents made to the Society, the Council ordered their best thanks to be communicated.

The Council then adjourned to Wednesday next.

A WEEKLY COUNCIL was held at the Society's House, in Hanover-square, on Wednesday, the 12th of February; present, Mr. PUSEY, M.P., Trustee, in the chair; Lord Ashburton, Hon. Dudley Pelham, M.P., Right Hon. Sir James R. G. Graham, Bart., M.P., Right Hon. Thomas Francis Kennedy, Sir Thomas Dyke Acland, Bart., M.P., Sir Thomas Tancred, Bart., Sir Robert Price, Bart., M.P., Mr. Alcock, M.P., Mr. Raymond Barker, Mr. Bramston, M.P., Mr. Burke, Mr. D. Burton, jun, Dr. Calvert, Mr. Pole Carew, Colonel Challoner, Mr. Christopher, M.P., Mr. Clavering, Mr. Commerell, Mr. Layton Cooke, Mr. Dyer, Mr. T. B. Evans, Mr. Foley, M.P., Mr. R. Fox, Mr. Fuller, M.P., Mr. Brandreth Gibbs, Mr. Leveson Gower, Mr. Hamond, Mr. Fisher Hobbs, Mr. Jacson, Mr. Langston, M.P., Mr. W. Long, Mr. Maddison, Mr. Majendie, Mr. Marshall, M.P., Mr. Wykeham Martin, Mr. Miles, M.P. (Leigh Court), Mr. W. Mundy, Mr. Ralph Neville, M.P., Mr. C. E. Overman, Mr. Paynter, Mr. Pendarves, M.P., Mr. C. Pocock, Mr. D. Pugh, M.P., Captain Rushout, M.P., Professor Sewell, Mr. Villiers Shelley, Professor Simonds, Mr. Slaney, M.P., Mr. Augustus Smith, Mr. Stansfield, M.P., Mr. H. Strafford, Mr. Spencer Trower, Professor Way, Mr. Wilson (Stowlangtoft), and Mr. Wrightson, M.P. Among the distinguished visitors present (not being members of the Society), were Sir George Grant Suttie, Bart., Mr. Macartney, LL.D. Vice-President of the Flax Society of Ireland, Dr. Cooke, Professor of Chemistry and Mineralogy in Havard College, America, Dr. Ryan, and Mr. George Hoare.

Flax-Cotton.—The Chairman informed the Council, that in consequence of the great interest, in a national point of view, attached to the recent discoveries of M. Claussen in rendering Flax subservient to the purposes of cotton, and the importance to the farmers of this country of every fact affecting the cultivation of Flax, he had requested that gentleman to favour them with his attendance on that occasion, in order that he might explain to the members present his views on the subject of the increased demand that might possibly arise for the article of Flax by the British manufacturer, in consequence of the facilities offered by his new process, for adapting it to purposes of a more general character, and the greater attention the Flax crop would deserve on the part of the agricultural community; reserving to a further meeting the opportunity of detailing to the Council the chemical and mechanical processes by which Flax is converted into a substance possessing for manufacturing purposes all the properties of foreign cotton. The Chairman hoped that this discovery, if found to be equal to the expectation formed of it, might, perhaps, constitute a new bond of union between the farmer and the manufacturer of this country. He need scarcely add the caution, that the Council were not responsible for the opinions which might be laid before them on this subject, as their own rule, like that of other similar bodies, guarded them from any danger of misapprehension on that point. The statement of M. Claussen would rest on its own merits, or otherwise; and they were obliged to that gentleman for favouring them with his views on the subject, at their first weekly council of the session, and previously to the final enrolment of his specifications.

The Chevalier Claussen, attended by Mr. Edward M'Dermott, Mr. J. S. Christopher, of Gresham-street, Mr. Thomas Graves, and Mr. C. J. Pownall, were then introduced to the Council, when M. Claussen stated that as he feared he should not be able to make himself sufficiently intelligible in English, he had requested his friend, Mr. M'Dermott, to draw up a paper on the general question of the cultivation of Flax, which, with the permission of the Council, that gentleman would read; after which, he and other of his friends would be happy to afford the Council such information, as to his process, as the circumstance of his not having finally enrolled his specification would be prudent for him to state. Mr. M'Dermott then read the following paper:

REASONS IN FAVOUR OF AN EXTENDED CULTIVATION OF FLAX AND HEMP IN THE UNITED KINGDOM.

My object, gentlemen, in reading the present paper, at the request of your esteemed Chairman, is to submit to you, and through you, to the great agricultural body of England, a few facts bearing on the importance and advantage which, in a national and individual point of view, would result from a more extensive cultivation of fibrous plants in this country. In venturing humbly to submit these facts and opinions to so important and influential a body of gentlemen as those who compose the Council of the Royal Agricultural Society, I am far from wishing it to be understood either that I conceive them to be ignorant of many of the facts which I shall have occasion to adduce, or that the subject of Flax culture is one to which they have not already paid some considerable attention. On the contrary, many of the valuable reports of your Society, and the prizes given for Essays on the subject, prove that it has at various times engrossed your consideration, and formed the theme of serious deliberation at your Councils. Markets comparatively undeveloped; ignorance of the true character and structure of the plant; prevalence of modes of cultivation and preparation of the fibre, wasteful and injurious in themselves, and attended with an enormous amount of risk and trouble to the grower, have, hitherto each had their weight in inducing your Society to withhold its valuable recommendation in favour of an extension of Flax culture.

The progress of science, and the skill and enterprize displayed by many of the agriculturists of England and of Ireland, have however, now placed the matter upon a perfectly different footing, and upon one which I venture to submit should induce the Royal Agricultural Society, in the most strenuous manner, to urge upon the farmers of the United Kingdom the propriety of immediately devoting some portion of their land to the cultivation of Flax.

Climate and Soil of England suited to its Growth.—That Flax *can* be produced in this country is a point upon which I apprehend little doubt now exists; and it is unnecessary for me, especially before such a body as that which I have now the honour of addressing, to argue such a question. Suffice it, therefore, upon this point, to say, that in many respects our climate is better adapted for its growth than even Belgium, inasmuch as we are not subject to those severe droughts which, occurring in the spring, in that country, frequently inflict very serious damage upon the young crop. Flax is grown, to some extent, in almost every part of the United Kingdom—it has been grown with success upon an Irish bog, and in the fen districts of England—on the summit of the Wicklow mountains, and upon the Beacon-hill of Norfolk, in the midland counties of England and the western shores of Galway and Mayo, upon rich and poor, clayey, gravelly, alluvial, and every variety of soil.

Importance attached to Growth of Flax by Governments.—This suitability of our climate and soil to the production of Flax, and the importance which in earlier times was attached to it, is sufficiently evidenced by the numerous legislative measures which at various times, from the reign of Henry VIII. to that of George III., have been passed in order to promote and encourage its growth. The "Transactions of the Board of Agriculture" for 1742, contain a letter, written by Robert Somerville, Esq., of the East Lothians, in which the writer regrets, notwithstanding these encouragements and the bounties offered by the liberality of the Government, that the cultivation of Flax should then have been so extremely limited, and the management in every stage, both of its culture and manufacture, so very defective.

"This," he says, "is the more to be regretted, as there can be little doubt that immense quantities might be raised in Britain with little labour, and that, too, upon soils where hardly anything else will grow. The accomplishment of an object so truly desirable as that of the extended cultivation of Flax, would be attended with the most salutary effects, by affording employment for an increased population, and materially lessening *our dependence upon foreign countries.*"

But if, upwards of a century since, great importance was attached to this subject, on the ground of *increased population and dependence on foreign countries*, of how much greater importance and advantage ought it not to be considered at a time when our population is more than doubled, and our *consumption of cattle food*, formed from Flax seed, and of raw material for our manufactures, have increased to an extent which, a *century* since, would have been considered fabulous and incredible; and at a time, too, when our railways and improved means of transit give such increased facilities to the grower for the disposal of his produce.

Markets.—In urging upon the agriculturists of England the propriety of an extended cultivation of Flax, I am anxious first to show them the enormous extent of the *existing markets* for their produce, which is now almost exclusively engrossed by the foreign producer; and the vast demand which is now opening up, in consequence of the recent discovery by which Flax may be employed in our silk, woollen, and cotton manufactures; and which, if not speedily secured by our home producer, must, in like manner, be supplied by the foreign grower. The markets which at *present* exist for Flax are twofold in their character—agricultural and manufacturing. Under the former are comprised those large quantities of oil-cake and of Flax seed for sowing and crushing purposes, which are annually consumed in this country.

Oil-cake.—Upwards of 70,000 tons of oil-cake are annually imported, the value of which exceeds £500,000, the whole of which might be produced by our agriculturists with the most perfect ease, and with profit and advantage to themselves. In connexion with our supply of foreign oil-cake, it is worthy of remark, that by far the larger proportions are sent from those countries which are the largest exporters of cattle to this country. By the almost total neglect of the cultivation of Flax our farmers are thus placed in the anomalous position of *dependence upon those countries* for the supply of food for their cattle, which compete with them in our markets, and in several instances we are actually compelled, in addition to the price set upon the cake, to pay a considerable duty imposed by the Government of the exporting countries.

Flax-seed for Crushing.—From *Russia* we import annually half a million of quarters of Flax-seed, the value of which is upwards of a million sterling. Our total imports of Flax-seed for sowing and crushing, from all countries, in round numbers, are about 650,000 quarters, the value of which, at the low price of 7s. per bushel, is £1,820,000. There is no reason whatever why this large sum might not be annually saved to the pockets of our agriculturists, nor why the makers of linseed oil should not be supplied exclusively with home-grown seed for the purposes of their manufacture. The cultivation of Flax at home, *if only for the seed,* would render our oil-pressers independent for their supply upon foreign countries, and would give to our agriculturists a return of upwards of £2,000,000 annually. It would also give them an article more valuable for cattle-food than the oil-cake purchased from foreign countries, and which consists of the mere refuse and husks which remain after the expression of the oleaginous properties from the seed; or if it should be preferred by some still to use cake, the seed could be sold to the "oil-presser," and the grower might fatten his cattle upon cake produced from home-grown instead of from foreign linseed.

Sowing Seed.—With an increased cultivation of Flax at home, we should also be spared the dependence upon foreign countries for our supply of seed for sowing purposes, and which we now import to the value of some £200,000 per annum; for it is absurd to suppose that flax can only be grown in this country from foreign seed; the reason for this opinion being no doubt traceable to the prevalent mode of pulling the Flax before fully ripe.

Manufactures.—Passing on, however, from the agricultural demand which exists for the production of the crop in the shape of *seed*, I will now call your attention to the existing market and the sources of supply for the *fibre* of the plant required in our manufactures. It cannot fail to be a matter of deep regret to every well-wisher of his country, that in the two main branches of our textile manufactures we are so completely dependent for the supply of the raw material upon foreign countries. Our cotton manufactures absorb *daily one thousand tons* of cotton wool, the produce of foreign countries alone. For our supply of cotton, we must, no doubt, still continue to be dependent upon foreign countries, inasmuch as the material cannot be produced *at home;* but there is every reason to believe that by the adaptation of Flax to cotton machinery this extent of dependence will in future be considerably less than it has hitherto been, provided our agriculturists will but come forward in earnest, and endeavour to supply the new demand for their produce thus created. Our linen and other manufactures in which Flax is employed are all but completely dependent upon foreign countries for their supply; and of the 100,000 tons now annually consumed, not more than one-fourth is produced in this country. The total value of the Flax fibre imported for manufacturing into linen, sail cloths, tarpaulings, rick covers, sacking, and other materials, exceeds £5,000,000 annually; and there is no doubt, judging from the rapid progress of our Linen manufactures, that if the supply of the raw material could be more readily obtained at home, the consumption would be increased to a still greater extent. The progress of the linen trade, in consequence of the great improvements which have been made in machinery, has within the last 20 years been almost unparalleled. The exports of linen have increased since that time from 50,000,000 to 105,000,000 of yards, and its declared value from £1,700,000 to upwards of £3,000,000. No attempt whatever has been made on the part of our agriculturists to meet this enormous and rapid increase in the demand for the raw material; and as a consequence, the foreign producer has been reaping a golden harvest from the monopoly which he has possessed. The imports of foreign Flax have increased from 936,000 cwts. in 1831 to 1,800,000 cwts. in 1842. The value of the *increased* imports being not less than *two millions and a-half,* nearly the whole of which is paid for in money sent out of the country.

Hemp.—We also import large quantities of Hemp, which might, like Flax, be easily and profitably grown at home. The value of the Hemp annually imported is about £1,500,000. We have thus a demand existing for Flax and Hemp, and for the supply of which we are dependent upon foreign countries, shown in round numbers by the following figures:—

Flax fibre	£5,000,000
Seed for crushing	1,800,000
——— sowing	200,000
——— Oil-cake	600,000
——— Hemp	1,500,000
	£8,900,000

New Markets.—Hitherto I have spoken only of the *existing markets:* I am now anxious to call your attention to that great demand which will be opened up by my discovery of the mode of adapting flax to cotton and woollen machinery. The substitution of flax for cotton is now no longer a matter of doubt. Recent experiments at Rochdale have completely set that question at rest. Important as may be the considerations connected at present with the linen manufactures, and cogent as may be the arguments deduced from them, in order to induce you to obtain possession of the ground now occupied by the foreign producer—infinitely more important, and far more forcible, are those which may be drawn from the prospective demand now springing up in our cotton manufactures. The consumption of the raw material must of necessity be governed by the machinery which exists for its manufacture, and the spindles of Belfast, of Dundee, and of Leeds, are already supplied with the produce of foreign countries. Not so, however, with respect to flax and its adaptation to the cotton manufactures. Millions of cotton spindles are ready at once to take to the new material and spin it for you, without the slightest alteration being required in their arrangement. A thousand tons of cotton daily, or 770,000,000 of lbs. annually, are consumed in our cotton manufactures, and the result of my recent experiments has been such as to show that flax may be substituted for one-half at least of this amount. In order, therefore, to supply the *new demand* for a *new material* thus created, the produce of 2,000 acres will be required for each day, and the whole of the Flax grown in the United Kingdom does not amount to more than one-seventh of the supply required for Manchester alone. It is a duty imperative upon the agriculturists of the country to endeavour to meet this enormous demand, and not to allow it to pass into the hands of foreign countries, which will inevitably be the case if they do not immediately exert themselves in this respect.

Wool.—But not Manchester alone, but the woollen districts of England, await with anxiety an increased supply of Flax which shall be available for the purpose of spinning in combination with wool, upon the existing wool machinery. I will not trouble you with statistics upon the subject of our woollen manufactures. The population of Leeds, Bradford, and other towns in the woollen districts, are kept in a state of prosperity by the employment which it affords; and the introduction of Flax into that particular branch of our manufactures would have the effect of reducing the price of the material by 25 per cent., and of giving an increased amount of employment in those districts. A firm in Bradford has already taken steps to carry on the manufacture, and will alone require the produce of 5,000 acres in the ensuing year.

Deficient Supply of Cotton.—In connection with the supply of the markets already referred to, a further argument is to be found in the fact of the present diminished supply of the raw material from foreign countries. "There is," says Mr. Porter, in his remarks on the statistics of the cotton trade, in a paper read before the British Association last year, "a growing opinion that now, and for some years past, we have reached the maximum supply of cotton from the United States—a fact which, should it prove to be correct, makes it a matter of absolute necessity, either to seek for further supplies of the article from other sources, or to find some efficient substitute that shall provide the means of employment for our continually growing numbers." So great has been the deficiency of cotton in the United States during the past year, that the prices have risen cent. per cent. as compared with those of 1849, and our manufacturers are straining every nerve to endeavour to obtain an additional supply of cotton, and to reduce their dependence upon the United States for the supply of their staple article. The Manchester Chamber of Commerce, feeling the importance of the subject, have, at considerable expense, sent a gentleman to India for the purpose of obtaining information as to the probable extent to which they might depend upon that country for an increased supply of cotton. But to realize this much desired benefit there must be introduced into India a totally new system of managing this crop, and new and convenient modes of transit for bringing the produce of the interior down to the coast for shipment. Those acquainted with the habits and prejudices of the people of that country need hardly to be told with what difficulty such a change would be brought about, and how many years must elapse before the establishment of railways, or the formation of roads for the conveyance of the material produced under such an altered system. So far, then, as the arguments for an extended growth of Flax in this country, founded upon the present position of our cotton manufactures, are concerned, our agriculturists have to consider the diminished supply and increased price of cotton; the difficulty of obtaining the requisite supplies from other countries; and, above all, the fact that Flax can be advantageously employed as a substitute in those manufactures in which cotton is required.

Deficiency of Flax.—If again we turn to the position of our linen manufactures, it will be found that there exists in that branch also a most extraordinary deficiency in the supply of the raw material. In Ireland the cultivation of flax has fallen off during the past year, as compared with 1845, by nearly 60,000 acres. In Russia, from whence we derive our largest supplies, there has been a decrease in the amount of exports of Flax of nearly 150,000 "poods," or about twenty per cent.; and I find in the *Morning Chronicle*, which has devoted much attention to the subject of an extension of the growth of Flax, a circular of one of the largest houses in St. Petersburg, in which the following statement occurs:—

"We are to have a small supply of Flax next season, *not above one-half* of that which we had two years ago, and such high prices are consequently paying in the interior, that the dealers will not be able to lay it down here, to cost less aboard, than it is now selling for on your side; so that we are not likely to have any thing doing on contract for a long time, if at all this winter, unless the relative state of the two markets experience mutual alteration by an improvement on your side."

In Belgium, where the finest qualities of Flax are produced, the cultivation of Flax is considerably less than on the average of former years.

It is under these circumstances, with an increasing demand on the part of the manufacturers, and a diminished supply on the part of the foreign producer, that I venture to submit to the British agriculturist the taking some steps calculated to meet the existing state of things, to diminish our dependence upon foreign countries, and by so doing confer lasting benefits, both upon himself and upon his country. There is a happy conjuncture with this state of things and the time at which the present demand arises. Formerly, when our laws imposed restrictions upon the importation of grain for human food, our agriculturists might have conceived that there existed some kind of moral impediment in the way of increasing our home growth of articles for any purpose not of equal primary necessity. That impediment, whether rightly or wrongly I pronounce no opinion, has, however, passed away, and there is now no reason whatever why their fields should not henceforth be used for the production of any article that promises an adequate profit to the grower.

"It is," says Mr. Porter, of the Board of Trade, "especially desirable so to apply the productive power of the soil for the supply of articles *as indispensable* to the support of millions of our people as corn itself; and an *additional inducement* to the growth of Flax, beyond that offered by other articles, may be found in the fact that, to bring it to the same condition as that in which it is imported from foreign countries, calls for the employment of a considerable amount of human labour."

Objections to Growth of Flax: Agriculture.—But, if satisfied that ample markets exist for the sale of his produce, and that this sort of moral impediment to its growth has been removed, the agriculturist may still point to the objections entertained against the growth of Flax, both on account of its supposed exhaustive character, and the trouble, risk, and expense attendant upon its preparation for markets, as reasons why he should not enter upon the cultivation of the plant. With respect to the exhaustive character of the plant, and its consequent injurious effects upon the soil, there appears to be no reason for supposing that, under a proper and judicious mode of treatment, it is more exhaustive or injurious than any other seed-producing crop. An examination of the stem of the plant shows that those portions of it which are required for the purpose of manufacture, are derived almost exclusively from the atmosphere. Indeed, to so small an extent do the inorganic properties of the soil enter into the fibre, that it has been found upon analysis that 100 lbs. does not contain upon an average more than 2 lbs. of mineral matters, including lime, magnesia, oxide of iron, carbonic, phosphoric, sulphuric acid, and silica. It is the woody parts of the plant, the resinous matter of the seed, with its capsules and husks, which absorb from the soil the phosphoric acid and other fertilizing ingredients. If the Flax, unlike other crops, be not allowed to return anything to the soil; if the seed be thrown into the steep pit or "rettery" with the stem of the plant, and there destroyed; if instead of being employed as food for cattle, the straw or woody parts be rendered perfectly useless for all the purposes of manure, or mixing with cattle food, then undoubtedly Flax, like every other crop, would be *in itself* an exhausting crop. But practical experience, however, has fully proved that under a judicious mode of treatment, so far from being an exhaustive, Flax is actually a renovating crop. Numerous instances might be cited upon this subject. Mr. Edmonds, of Stonehouse, near Plymouth, stated, in 1843, "It is a mistaken opinion that Hemp and Flax impoverish the land; from *long experience* I have found the contrary; these are crops that make a *greater return as to manure than any corn crop*."

Sir Richard O'Donnell, who is one of the largest cultivators of Flax in Ireland, and who has grown to the extent of 700 acres in one year, states in the *Morning Chronicle*, "As the results of many years' experience, that when grown in its regular rotation, Flax is so far from being exhaustive, that it tends greatly to improve the soil and the character of the other crops in the rotation. It is above all most valuable for laying down land after Wheat or Oats, as the process of pulling the Flax, by loosening the earth around the roots, improves greatly the quality of the Grass crop."

Mr. Warnes, whose exertions as a practical agriculturist, to promote the extension of Flax culture, are deserving of all praise, and whose system of agriculture rests upon the growth of Flax, and the fattening of cattle in boxes, upon the seed, incorporated with other produce of the farm, both summer and winter, has introduced the Flax plant into every rotation upon his farm; and, judging from the results of his own experience, he states that no rational assertion can now be urged against the growth of Flax, as the improved systems of cultivation and preparation have rendered obsolete the clauses in old leases, prohibiting the culture of the plant, and the antiquated notion that fibre and seed cannot be secured at the same time. So far, therefore, as the exhaustive character of the plant is concerned, there appears to be no sufficient ground for entertaining such an opinion.

PREPARATION FOR MARKET.—A further objection to the growth of Flax is, however, to be found in the nature of the process hitherto required to be employed previous to its preparation for the market. So long as it shall continue to be considered necessary for the grower to embark in the present troublesome and uncertain process of steeping the Flax in the straw, it will be in vain to expect any very general or extensive growth of the plant. Although considerable advance has no doubt been made in the preparation of the fibre during the last few years, still the present mode is far from being suitable to the great body of the farmers of the United Kingdom.

DEW RETTING.—Under the system of preparing the Flax, hitherto four modes of steeping or retting the plant are resorted to. The first consists of the plan of "dew retting," or allowing the Flax to remain exposed on Grass land for a considerable number of days exposed to the action of the rain, dews, and atmosphere. The plan, however, is one which, from its obvious inconveniences, is not calculated to meet with general approval in the present advanced state of agriculture, and is indeed very rarely adopted.

STEEPING IN STREAMS.—Probably the best mode of steeping the Flax is that of placing it in running streams, according to the mode adopted in Courtrai, the principal Flax-producing district of Belgium. The Flax so prepared generally realizes a much higher price than any other description of Flax. There are, however, certain peculiarities in the water of the river Lys which makes it admirably adapted for steeping purposes, and which are not possessed by any other streams in this country. Independent of the peculiarities of the water, the steeping of Flax in running streams cannot be made generally available in this country, as they are mostly too rapid in their character.

STEEPING IN PITS.—In the absence of suitable streams, recourse is had to a mode of steeping in pits or pools sunk in the ground. But so many favourable conditions are required to be obtained, and so many unfavourable ones to be avoided, in the selection of the site for the pool, and the supply of the water required, that it is probable that a desirable or perfect steep-pool could not be formed in any part of the country. The soil forming the bottom and sides of the pit will have an influence on the colour of the fibre; clay, gravel, alluvial and peaty soil, will each impart some peculiar dye to the material, which more or less affects its value. The water used in the pit or pool must not be spring water, and it must not have flowed over any soil containing metallic deposits; and rain water is not well calculated for the purpose. But, in addition to all these difficulties attendant upon obtaining the requisite means, the grower of Flax has to contend against all the uncertainties and risks of either over or under-steeping his Flax. "One sultry night," says one of the reports of the Royal Flax Society, "while it is in the steep, and nearly rotted sufficiently, is enough to carry the fermentation beyond the safe point. So much is this feared by farmers, that almost all Flax is underwatered; and although much of it is afterwards mannered on the grass, yet the great proportion is brought to market with the shores still unseparated in bits on the fibres." But while the sultry nights of summer are unfavourable to the steeping of Flax, and inconvenient to the farmer, inasmuch as his labourers are at that season generally otherwise employed, it is also obvious that during the winter, when comparatively little farm labour is carried on, the process of steeping must be discontinued altogether, in consequence of the temperature.

SCHENCK SYSTEM.—A fourth process has, within the last few years, been very strenuously advocated by the Royal Flax Society in Ireland, which consists in steeping the Flax in hot water. This mode, although doubtless an improvement upon any of the existing plans, still does not afford the means of obtaining that complete separation of the fibres which it is desirable to obtain. The Belfast Society do not pretend that this is a mode generally applicable to the use of the producer of Flax, for under what they term a "division of labour" they propose that the whole process of preparation, with the profits attendant upon it, and the additional labour required, shall be taken out of the hands of the growers, whom it designates as "a class of persons ignorant of the commonest chemical principles," and handed over to capitalists or speculators who would erect the required machinery in districts where the growth of a certain quantity of Flax would be previously guaranteed. According to the reports of the Society, it appears that the profits upon the preparation of an Irish acre of Flax would be something like 200 per cent upon the amount paid to the grower for his produce. The farmer is paid for his Flax a price ranging from £5 to £8 per acre; the steeper, upon this principle of "division of labour," receiving a net profit (I take the figures of the advocates of the plan) of upwards of £20.

With such *inducements* as these offered by the Flax Society, I doubt much whether the agriculturists of this country will feel very much disposed to enter upon the growth of Flax to the extent which the circumstances of the case require; and in Ireland I have no doubt but that the whole scheme, fraught with so many of the abuses of the middlemen system, will soon be found alike intolerable to producer and consumer.

The whole of these difficulties may, I believe, be easily overcome by the adoption of a system more in accordance with the present advanced state of practical science and knowledge, and which involves *the entire abolition* of the whole of the existing modes of steeping the Flax in the straw.

STEEPING INJURIOUS.—Not only is the present process of steeping inconvenient and unnecessary, but it is highly injurious, as it imparts its injurious dyes to the fibre, deteriorates, and gives to it an inequality of strength, which, in the subsequent stages of manufacture, are exceedingly difficult to be overcome. I have found this to be more particularly the case in the preparation of the Flax into a material capable of being spun alone or in combination with wool and cotton upon the existing machinery. I am anxious that the grower should not resort to any of the existing modes in the preparation of his Flax; for any one step taken in that direction entails subsequently the necessity of much additional trouble and expense, in addition to most materially affecting the strength and quality of the yarns and thread produced from it.

Purchase in the Straw. The mode in which I should most prefer to purchase the Flax would be in the straw, precisely as it is left after the removal of the seed. In this state it can be dealt with with a far greater degree of certainty than in any other, and may be, within four-and-twenty hours from the time of its being pulled ripe from the field, placed in a condition fit for preparation for spinning upon any of the Flax, cotton, wool, or silk machinery of the country.

Facility of Transit.—As there would be obviously many inconveniences connected with the transit and carriage to a large distance of a material so bulky as that of Flax in the straw, the grower might in certain cases, by the use of a common breaker and a pair of toothed cylinders, remove a great portion of the more bulky part of the plant, and thus send the fibre in a partially-cleaned state to the market. The chaff obtained from this partial separation of the straw from the fibre, which contains a very large proportion of the inorganic matter from the soil, and which not having been destroyed by the process of steeping, will form a most valuable material for mixing with cake, crushed seed, the mucilage formed from it, or other articles of cattle-food.

Further Process.—I am anxious, however, to see the growers of Flax deriving the full amount of benefit which is be obtained from the complete preparation of the material into a substance suitable at once for the markets of Belfast, Dundee, Manchester, and the woollen districts. I am aware that in the hands of individual growers the process, although not a complicated one, but which still requires some larger amount of acquaintance with the *higher* branches of chemistry than generally exists among the agricultural classes, must not be considered as generally available. I believe, however, that a plan might be very easily devised by which the Flax-grower might secure for himself these benefits, which, according to the recommendation of the Royal Flax Society, are to be exclusively engrossed by speculators and capitalists. Indeed several applications have already been made by parties requesting me to grant them monopolies under my patent, for the perfection of Flax, within an area of a certain number of miles in various parts of the country. I believe that such a course is one eminently calculated to rob the grower of his legitimate profits, and to retard that extension of the growth of Flax which I conceive to be indispensably necessary for the welfare of the country. Within the last few days, I have been informed of a case in which a gentleman in Ireland has for several years grown Flax to a very great extent in one of the districts in which a monopoly is possessed by a "steeper," under the patent system. Possessed of this monopoly over a large tract of country, such an individual has the whole of the growers entirely at his mercy, and can offer them whatever sum he pleases for their produce, knowing full well that no other available market exists for many miles. Indeed, to such an extent has this system of extortion been practised, that many of the growers have been compelled, after keeping the Flax in stack for the last two or three years, to sell for 30s. per ton that for which he would have received, but for this monopoly, from £3 to £4. The gentleman to whom I have referred has now about 700 tons of Flax in stack, which he will not sell at the ruinous price offered by the "steeper," and further states that he will not sow a single acre of Flax in the present year, unless some fresh mode of disposing of his produce is created.

Joint Stock Associations.—The mode in which I would venture to suggest this system may be prevented, and the growers be enabled to derive the full benefit of the perfection of the Flax, would be by the establishment in different localities throughout the country, by means of joint subscriptions among the Flax growers in such district, at which the preparation of the material could be carried on, and the profits derived from the process distributed at stated periods among the shareholders in proportion to the amount of shares or interest which they held in the undertaking. This system is one which has been found to work well among the cultivators of the sugar cane in the West Indies, and there is no doubt but that it would work equally well among the producers of Flax in this country.

Local Societies.—A second mode by which this object could be attained, would be by the erection of suitable premises and apparatus by each of the various local agricultural associations or farmers' clubs in the country, the buildings and plant being the property of the club or association, and the use of them being allowed to members or subscribers, upon payment of such sums per ton or per acre as might be agreed upon by the parties.

Landlords.—There is also a third mode which might be made available in the case of the failure of either of the preceding plans, which is, that of the erection of the required accommodation by the landlords for the use of their tenants, upon the payment of such sums as would be calculated to cover the interest of the capital invested, and the cost of keeping the buildings and apparatus in an efficient state of repair.

Profit.—There remains yet one very important point, to which I have at present only incidentally alluded—I mean the profit to the farmer upon the cultivation of Flax. If I have succeeded in convincing you of the extent and certainty of the market which exists for the produce, and of the absolute necessity which exists for your endeavouring to obtain possession of those markets, I have no doubt that I shall be enabled most satisfactorily to prove that you can do so with considerable profit and advantage to yourselves.

Seed and Fibre.—It will be found in the first place that the profit derived from Flax under the present modes of steeping, combined with the saving of the seed, is considerably greater than can be obtained from the cultivation of *Wheat*, at present prices. Mr. Warnes states that the profit upon 14 acres of Flax, grown and prepared by him last year, was upwards of £6 per acre over that of his Wheat. His figures are—

	£	s.	d.
Prepared Flax sold at Leeds	238	16	0
Value of seed	120	0	0
	364	16	0
Deduct cost of preparing Flax ..	140	0	0
Gross profit	224	16	0
Value of produce of 14 acres of Wheat, at 38 bushels to the acre, at 40s. per quarter ..	133	0	0
Total balance in favour of Flax over Wheat, not including 6 tons 6 cwt. of husks equal to Hay, 26 cwt. of tow, and many loads of refuse for littering cattle	£91	16	0

Seed alone.—The above is an instance in which both the seed and the fibre were saved and prepared. There are cases, however, in which the flax is grown solely for the purpose of seed, and others in which the seed is wasted or destroyed, the only object in such case being to obtain the fibre. In either case there is a greater profit to the grower than can be obtained from almost any other crop. Mr. Beare, probably one of the best farmers in the county of Norfolk, grows every year one or two acres of Flax after Wheat, and without manure, for the seed only. His crop last year yielded 26 bushels, which, at 10s. per bushel, would be worth £13; while his Wheat crop did not exceed five quarters, which, sold at 40s., would yield but £10, leaving a profit in favour of Flax seed alone (the straw being used as litter for cattle) of £3 per acre. I may state upon this point, as a general rule, under the present system, that, when grown for its seed alone, the Flax fibre is coarse, and is not considered of so much value as that of a finer description.

Fibre alone,—Seed destroyed.—Numerous instances might be adduced, from the reports of the Royal Flax Society, to show that even in cases where the seed has been thrown into the steep pits and destroyed, the profit upon the sale and preparation of the fibre was still greater than that of many other of the crops. As the example thus set is one, however, which is not likely to be generally followed by enlightened agriculturists in this country, it is unnecessary for me to trouble you with any figures upon that point.

New Process.—These, however, are returns obtained under the *present mode* of steeping and preparing the Flax.

According to the plan which I venture to submit, the returns will, I anticipate, be even MORE favourable to the grower.

Sold in Straw.—In the case in which he may elect to dispose of his *Flax in the straw*, the farmer would derive the full value of his crop of seed, and the straw would be worth to him £4 per ton, the produce being about two tons per acre. He will not be required, as is the case at present, to pull his Flax before it is perfectly ripe, or before the seed has been fully and completely formed. Indeed the *coarser and more developed* is the stem of the plant, the more valuable will it be for the purpose of adaptation to the woollen and cotton machinery, and the fine gossamer threads can be produced from it with greater certainty and precision than when pulled in an earlier stage of its growth. The grower, therefore, need be under no fear as to the fineness of his crop, and he may obtain from it as large an amount of seed as his land will produce.

Partial Cleaning.—If the difficulty of transporting the flax in the straw to any great distance should render it necessary for the grower to reduce its bulk, by the removal of some of the woody part of the plant, he will obtain by so doing, in addition to the seed, a valuable article of food for his cattle, and the enhanced value of the fibre will more than repay the amount of labour bestowed upon it.

Complete Preparation.—If disposed to carry the preparation of the flax to its usual stage of adaptation to the spindles of the manufacturer, whether cotton, linen, wool, or silk, he will derive a profit larger and more certain than any which he can obtain under the present process; while, from the refuse straw impregnated with the salts used in its preparation, he will obtain a manure of the richest and most fertilizing character.

Social Advantages.—One word upon the social advantages which must result from an extended cultivation of Flax, and my remarks (already, I fear, too protracted) will have been brought to a close. Upon this point, I cannot do better than quote a few words from the report of one of the special correspondents of the *Morning Chronicle* who visited the small village of Trimingham, where Mr. Warnes has for several years most sedulously and successfully devoted himself to the cultivation and preparation of the plant.

"The condition of the inhabitants of the village," he says, "was a few years since most deplorable, and the amount of pauperism exceeded that of the adjoining parishes. Since the introduction of Flax culture, this state of things has passed away. There is not a pauper in the parish; the poor-rates are nominal; there is not one able-bodied labourer, nor any portion of his family, who may not obtain constant employment throughout the whole of the year, and the moral and social state of the village will bear comparison with most. If the growth of Flax can produce results required similar to those which I have witnessed at Trimingham, there can be no doubt that the sooner it is cultivated to a greater extent in this country, the sooner will the enormous burden of pauperism decrease; and happiness and contentment be more generally diffused among the large masses of our labouring population.

The Chevalier Claussen then laid before the Council the following different specimens:

1. Samples of Flax in the straw, pulled and rippled.
2. Sample of Flax-straw, prepared according to the new process, adapted for linen manufactures.
3. Sample of long fibre scutched from part of No. 2.
4. Samples of Flax-fibre, adapted for spinning on cotton machinery.
5. Sample of yarn spun on cotton machinery, some from all the above Flax-fibre, others mixed in various proportions with the American cotton; these mixtures being termed by the inventor Flax-cotton.
6. Samples of Flax-fibre prepared for mixing with wool.
7. Samples of yarn produced on ordinary woollen machinery, composed of wool and Flax in various proportions, termed by the inventor Flax-wool.
8. Samples of flannel woven from the above.
9. Samples of fine cloth woven from yarn composed of Flax and fine wool in various proportions.
10. Flax-fibre prepared for mixing with silk, and dyed of various colours.
11. Flax-fibre mixed with spun silk, and termed by the inventor Flax-silk.
12. A sample of yarn produced from the above.
13. Samples of Flax-cotton yarn dyed of various colours.
14. Samples of cloth woven from Flax-cotton yarn and wool, dyed.

The following are the advantages detailed by the Chevalier Claussen and his friends, as possessed by the new process over the old methods:

1. That by the Chevalier Claussen's process the preparation of long fibre for scutching is effected in less than one day, and he always produces a fibre uniform in strength and entirely free from colour, much facilitating the after process of bleaching either in yarns or in cloth.
2. That he can also bleach it in the straw at very little additional expense of time or money.
3. That the former tedious and uncertain modes of steeping are superseded by one perfectly certain with ordinary care.
4. That in consequence of a more complete severance of the fibres from each other, and also from the bark and boon, the process of scutching is effected with half the labour usually employed.

[These advantages referred to that portion of the invention that includes the preparation of Flax for spinning upon the ordinary Flax machinery, and suited to existing markets. The further advantages have reference to the creation of new markets for British produce]

5. That by the new process Flax is rendered capable of being spun, either in whole or in part, on any existing spinning machinery.
6. That the fibre, to be mixed with cotton, or spun alone on cotton machinery, is so completely assimilated in its character to that of cotton, that it is capable of receiving the same rich opaque colour that characterises all dyed cotton; and, consequently, any cloth made from Flax-cotton yarn can be readily printed, dyed, or bleached by the ordinary cotton processes.
7. That Flax-fibre can be always produced with profit to the British grower at a less price than cotton can be imported into this country with profit to the foreign producer.
8. That as a consequence of this advantage, the manufacturers of this country will be less dependent on the fluctuations of the cotton crop for a supply of the raw material, and a more regular employment will be given to the manufacturing population, and the present amount of local rates be greatly diminished thereby.
9. That the British grower will derive great benefit from a supply of the wide demand thus opened to him.
10. That with respect to the advantages of being able to spin Flax in combination with wool on the existing woollen machinery, the first is, that the Flax prepared by M. Claussen is capable of being scribbled, spun, woven, and milled, in all respects as if it were entirely wool; having an advantage in this respect over cotton, which has not the slightest milling properties; on the contrary the Flax-fibre is capable of being even made into common felt hats with or without an admixture of wool. To such an extent has the milling properties of Flax been proved, that the sample of cloth exhibited had been woven to 54 inches wide, and milled up to 28 inches wide.
11. That the Flax-fibre will not, under any circumstances, when prepared for spinning with wool, cost more than from 6d. to 8d. per lb., while the wool with which it may be mixed will cost from 2s. to 4s. per lb.; consequently reducing the price of cloth produced from this mixture 25 or 30 per cent. below the present prices of cloth made wholly from wool, and being of equal, if not greater durability.
12. That short-wool refuse, which cannot by itself be spun into a thread, may, by being mixed with this thread, be readily spun and manufactured into serviceable cloths.
13. That there is a probability of a further demand being opened up for this fibre in the flannel and woollen trade.
14. That by this process Flax may be also so prepared as to be spun in any certain proportions with silk upon the existing silk machinery; that when so spun, it is capable of receiving considerable brilliancy of tint. That the fibre may be prepared for thus spinning at an uniform price of from 6d. to 8d. per lb. That as it may be spun in any proportions with silk, it is evident that the price of the yarns must be reduced according to the relative proportions of the materials employed, thus extending the markets, and giving increased employment to the operatives.
15. That, by M. Claussen's process of bleaching, any useless Flax can be converted into a first-rate article for the paper-

maker, at a less price than the paper-maker is now paying for white rags; and suitable for the manufacture of first-class papers.

In conclusion, M. Claussen and his friends had no doubt that a plan might be devised by which the grower of Flax would derive not only the benefits to be obtained from the sale or consumption of his Flax-seed, and the sale of his straw, as stated in the paper read, and the further advantages to be derived by him from the partial separation of the woody part of the stem from the fibre, which would reduce the cost of transit, and provide for a larger return to the land; but also the larger profit to be derived from the transforming of the straw into fibres suitable for any of the purposes above described, according to the suggestion pointed out in the paper read to the meeting, and thus secure to themselves that double profit, which, under the present system, it was all but impossible for them to obtain.

Sir James Graham inquired whether the farmer, in separating the seed from the straw, would be liable to injure the fibre? To which

M. Claussen replied that no such injury to the fibre would arise from any of the present modes of separating the seed from the straw, so long as the separation was made longitudinally; that an ordinary thrashing-machine might be so employed as not to injure the fibre; in fact, that the only injury that could arise would ensue from breaking the fibre across, or steeping it on the old system.

The Chairman thought it desirable that no time should be lost in putting the farmer in possession of all the conditions under which flax could be grown advantageously, and conveyed to market at a profit, as the time for sowing the crop was near at hand.

Mr. Alcock, M.P., stated that coals could be brought from Yorkshire at 7s. 6d. per ton, but they were a compact heavy article of transit, while flax would be bulky and light.

Mr. M'Dermott observed that the bulk of the flax might be reduced by partial removal of the straw by a machine that would not cost more than £10, and also by hydraulic pressure, as in the case of hay for exportation, and that probably the railways might eventually contract at lower rates for the conveyance of this new branch of traffic.

Mr. Majendie thought if the machine was portable, it might be let out from farm to farm. If the new process did not produce any injurious effect on flax that rendered it unfit in any degree for subsequent use in all the ordinary stages of manufacture, it would prove of great benefit to the country.

Mr. Christopher, M.P., and Colonel Challoner, thought it desirable that the cost of machinery required by farmers for commencing this branch of cultivation, so new to many of them, should be accurately ascertained.

Mr. Miles, M.P., had been just endeavouring to obtain that information from one of M. Claussen's friends near him, and it appeared that one machine only was essential, but that two might, for further preparation of the flax, be employed, if the farmer thought proper; the first machine would cost £10, and the object of it was partially to separate the fibre, leaving the shoves or gross remaining matter, amounting to two-thirds of the original flax, behind, to be returned by the farmer to the land; the second machine would cost £50, and was adapted for clearing the fibres effectually from the refuse after the first chemical process.

The Hon. Dudley Pelham, M.P., conceived it important to inquire into the effect that the introduction of this new system would have on the relative employment of labourers in flax culture and its operations.

Mr. Kennedy inquired the price of new "British cotton" compared with that of the ordinary foreign cotton, and was informed that it was from 4d. to 6d. per lb.; while the foreign cotton ranged from 8d. upwards, according to quality.

Mr. Fisher Hobbs informed the council of the result attending flax cultivation in the eastern counties, where the grower had been unable to obtain a market for their produce. The farmer's capital was, he thought, too nearly exhausted at the present moment to render it prudent for him to embark in any new line of cultivation, without being first well assured that after having overcome all the practical difficulties of a new crop, and its preparation for sale, he should find a ready market for its disposal. He hoped, as in the case of wool, that there would be a probability of farmers having a flax market, so that the article might be taken off their hands at so much per acre or ton, without loss or risk of the capital employed. Seeing among them that day a member of the distinguished family of the Leeds flax-spinners, he would appeal to him on this point, in the hope that he would be able, from experience of the whole question, to favour them with an opinion on the subject.

Colonel Challoner then ascertained, by inquiries addressed to M. Claussen, that flax injured by the farmer for sale and use under the old system, was available and equivalent to uninjured flax for the purposes of M. Claussen, who would give as good a price for it.

Mr. Marshall, M.P., replied that his brothers were the flax spinners; he was only, to a limited extent, a grower of flax for their use. They were, he believed, in the habit of paying £7 or £8 per acre for the use of land for the flax crop, they bearing all the expenses of cultivation, while the farmer had the benefit of the land for the remainder of the year. There was at the present time, he believed, a considerable market for flax. In Belgium the "fabricant" relieved the grower of all trouble and responsibility attending his crop, visiting his farm in person and taking it at a valuation. On the present plan, the object was to obtain long fibre; cloth formed of which in the warp with cotton in the weft was stronger than that formed entirely of cotton, and more durable in wear, being employed for sheeting and shirting. On the new principle, the flax, it appeared, was broken up into short fibre; and instead of steeping in hot or cold water, chemical means were employed to facilitate the process without injury to the material. If land was clean and in good order, flax might be grown without manure. But the farmer could not, under the present system of steeping, both grow it and prepare it for the manufacturer. With regard to thick and thin sowing, that question had reference to the object of the cultivator, namely, whether a fine fibre and little seed were required, or a coarser fibre with a full crop of seed. On the banks of the Lys, in Belgium, where the finest flax had been grown for centuries, and used for making the finest lace, they practised thick sowing, 3½ bushels per acre, and obtained about 14 bushels of seed per acre; but the stems were long and straight, without branches, and the longest fibre was obtained. In Ireland and Russia thin sowing was practised, from 2 to 2½ bushels per acre, and from 16 to 20 bushels of seed were obtained; but the stems of flax branched out more, and an inferior fibre was the result. It would be the safest plan for beginners in this country to sow thin, and thus get more linseed and straw. He concluded by remarking that if M. Claussen succeeded in his laudable endeavours, so much the better would it be for the farmers of this country.

Mr. Macartney thought that the average growth of flax in Ireland had not fallen off. He referred to Lord Clarendon's liberal aid in promoting its cultivation in that part of the United Kingdom, to the mode in which the factors purchased the crops, to the cost of conveyance, and to Scheuck's improvement in steeping.

Mr. Hamond had grown flax in Norfolk, but finding no market for his produce he had sent his flax to be manufactured into linen for his own shirts. He had also had several of the cottages on his estate thatched with the straw, and more beautiful thatch he never saw.

Mr. Fuller, M.P., had also grown flax, in Sussex, but he had no better success in getting it off his hands; and when he offered it to a large manufacturing house, he was told that they could only give him linen in return for it.

Mr. Shelley remarked, that there was no difficulty in farmers growing flax, the only difficulty was to get a market for it. In Sussex it could not be turned into money. If M. Claussen could make it marketable for them, he would find no want of growers. It was, he thought, of little purpose to tell farmers of the quantity grown and the price it ought to fetch.

M. Claussen replied, that it was both simple and easy to prepare the flax for the spindle, and he would undertake to furnish persons properly instructed who would direct the farmers how to proceed. There was one house at Bradford, that of Messrs. Quitzow, Schlesinger, and Co., flax-spinners, dyers, and merchants, whose only fear was that enough flax would not be grown for their use; and they were, he believed, ready to give £4 per ton for flax of fair quality.

Professor Way observed that the present system of preparing flax only applied to existing markets. M. Claussen's method, as he understood it, had the merit of opening new and extensive markets for this article; and there was one important point in the new plan—that there would in future be no distinction of flax into fine or coarse qualities. The farmer, too, under the new system, would not be obliged to pull his flax, as under the system hitherto in use, before it was ripe, in order to secure a higher price for his fibre; but, on the contrary, it will not be necessary to pull it until the seed and stalk were fully ripe. The farmer would thus obtain a larger proportion of fibre in proportion to the bulk, and a heavier crop of seed. He understood the quality of fibre in the new process not to be so essentially of importance as under the former plan, and that farmers may break the flax to reduce its bulk. The new material would be intermediate between linen and cotton; less valuable than the one, but more valuable than the other.

Mr. Shelley then rose to propose a vote of thanks to M. Claussen for the favour he had done them in his attendance on the occasion, and the information he had laid before the Council. He heartily wished him success in the practical development of his discovery, and hoped that the farmers would reap the benefit of it, and obtain a fair remuneration for their produce.

Mr. Miles, M.P., seconded the motion. Kind, indeed, it had been of M. Claussen to come before them that day, before he had completely secured his patent, to give them the earliest notification of the agricultural bearing of his researches. He trusted that the result would prove as good for himself as for the farmers, whose interests he had then advocated.

The Chairman then put the vote, which was carried unanimously. He was sure they all felt deeply obliged to the Chevalier Claussen for the favour he had done them. The information had been fully submitted to their consideration, but of course they received it without any inference being drawn from such reception that the Council held themselves responsible in any degree for the opinions expressed by M. Claussen. He thought it his duty, as their chairman, to repeat this caution. On that day fortnight, namely on Wednesday, the 26th of February, at noon, M. Claussen had consented to again attend, for the purpose of detailing, after the completion of his specifications, the details connected with his new process. Mr. Beale Browne would probably on the same day bring forward the statement, of which he had given notice, of his long experience in the cultivation of flax.

A Weekly Council was held at the Society's House, in Hanover-square, on Wednesday, the 19th of February: present, his Grace the Duke of Richmond, K.G., President, in the chair, Sir Charles Lemon, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Mr. Raymond Barker, Mr. Burke, Mr. D. Burton, jun., Dr. Calvert, Mr. W. Clavering, Mr. Gadesden, Mr. Leveson Gower, Mr. Jacson, Mr. Majendie, Mr. C. E. Overman, Mr. Sanford (Ninehead-court), Professor Sewell, Professor Simonds, Mr. Stansfield, M.P., Mr. R. Thompson, Professor Way, and Mr. Wilson (Stowlangtoft).

Phosphorite. — The President made an interesting statement to the meeting on the subject of native phosphate of lime, and the probability of its occurrence among the metamorphic masses in this country. His Grace had been in communication with Sir Roderick Murchison and Professor Daubeny on this subject, which might prove one of great importance to the practical farmers of the United Kingdom, should the mineral phosphorite, containing as it did so large an amount of bone-earth, be either obtained from abroad at a moderate cost, or be found occurring in our own islands. The Council, at the suggestion of the President, directed the Secretary to make such inquiries, for the information of the members, in reference to this mineral, as might lead to farther researches for the discovery of its occurrence.

Political Neutrality.— Mr. Dawson, of Osgodby Hall, near Selby, addressed a letter to the Council, complaining, as a member of the Society, of political bias in the proceedings of the Council. The President expressed his regret, that any individual should suppose it possible, constituted as the Society was, and engaged as it had now so long been in the promotion of practical agriculture, that the Society could become in any degree political. Neither the individual who for the year presided, as his Grace then did, over the body, nor the Council, as its representatives, had the slightest power, under the stringent conditions of the royal charter of its incorporation, to infringe its neutrality in this respect; on the contrary, if it could be proved that they did so, it would be the duty of her Majesty's Attorney-General, *ex officio*, to take steps for depriving the Society of its chartered privileges. The condition in the charter to which his Grace particularly alluded, was the following:

> "And know ye, further, that in granting this, our Royal Charter to the said Royal Agricultural Society of England, we do hereby declare it to be our full and entire will and pleasure, that we extend our Royal protection to its national objects, under the condition that a principle of its constitution shall be the total exclusion of all questions at its meetings or in its proceedings, of a political tendency, or having reference to measures pending, or to be brought forward, in either of our Houses of Parliament; which no resolution, bye-law, or other enactment of the said body politic and corporate, shall on any account or pretence whatever be at any time allowed to infringe."

The Duke of Richmond concluded by observing that, should unfortunately the Society ever endanger its constitution by any deviation from this salutary restriction, and thus deprive itself of the united energy it now derived from the concurrence of all parties in the patriotic object of promoting the practical agriculture of the country, he would be the first man to quit its ranks.

On the contrary, believing, as he did, that the Society had been, and would continue to be, of the greatest national importance in developing the resources of the kingdom and promoting the common interest of all who were connected in any relation with the cultivation of the soil, he should give to it, on all occasions, his warmest and steadiest support.

Miscellaneous Communications.—Mr. Graham, of Dalby-terrace, Islington, communicated a paper on what he conceived to be errors in some of the present modes of farming in England; also a plan of a farm homestead.—Dr. Calvert laid before the Council a paper, accompanied by statistical details, on the loss sustained by the grower of corn and the producer of animal food, by the indirect means through which they reached the consumer through the baker and the butcher as "middlemen."—Mr. Dalgairns, President of the Royal Agricultural Society of Guernsey, transmitted a communication on measures taken in that island for the production of silk, by the formation of a model-farm and the establishment of a laboratory; many hundred mulberry-trees having been planted last spring, several thousand cocoons produced, and the raw material sold to so great an advantage, as to render the growing of silk a subject worthy, in Mr. Dalgairns' opinion, of the attention of English cultivators.—Mr. Law, of Urmston Lodge, presented ears of Cobbett's and Keene's varieties of Indian Corn, grown near Manchester.—Mr. Aplin, of Combe St. Nicholas, called the attention of the Council to the complaints made in Dorsetshire and Somersetshire, that the horned sheep of those counties, being a distinct breed, and unqualified to compete with the Southdowns, had not had a distinct class for fair competition at the Society's Shows. The Council referred this letter to the special Council in Dec. 1851, when the prizes of next year will be taken into consideration.—Mr. Cotham suggested, that a heavier fine ought to be levied on those exhibitors of implements at the Society's Shows, who bespoke a greater amount of space and shedding than they actually occupied at the time of the Show. This suggestion was referred to the Council in August next, when the conditions for the show of implements next year will be decided upon.—Sir John Conroy called the attention of the Council to a simple apparatus, by which sacks, filled with heavy substances, may be lifted by a man on his own back, without the assistance usually required of two other men.—M. von Blücher transmitted a copy of his papers on fertilising the surface of land.—The Council ordered their usual thanks for the favour of these respective communications. The Council granted leave for the exhibition to the members, at the next weekly meeting, of a new gutta percha pump for liquid manure.

A Special Council was held on Thursday last, the 20th of February, for deciding on the site of the show-yard, &c., and the regulations connected with the Society's country meeting of 1851: present, his Grace the Duke of Richmond, K.G., President, in the chair, Lord Southampton, Hon. R. H. Clive, M.P., Sir Charles Lemon, Bart., M.P., Mr. Bramston, M.P., Mr. Brandreth (Houghton House), Colonel Challoner, Mr. Druce, Mr. Foley, M.P., Mr. Brandreth Gibbs, Mr. Grantham, Mr. Fisher Hobbs, Mr. Kinder, Mr. Sanford (Ninehead Court), Professor Sewell, Mr. Shaw (London), Mr. Villiers Shelley, Mr. Stansfield, M.P., Mr. C. Hampden Turner, and Mr. Jonas Webb.

The President having detailed to the Council the various steps he had taken, agreeably with their request, in reference to a suitable site for the Society's show of breeding stock this year, and the communications into which he had entered with several members of her Majesty's Government on the subject, proceeded to read to the members the correspondence which had taken place between himself and those distinguished individuals; his Grace, in conclusion, desiring Colonel Challoner to lay before the meeting the report of the Inspection Committee. The Secretary then received from Colonel Challoner, and at his request read to the Council, the following report:—

REPORT OF THE INSPECTION OF SITES' COMMITTEE.

His grace the Duke of Richmond, as President of the Society, having placed himself in communication with Lord John Russell and Lord Seymour, agreeably with the request of the Council, at their last monthly meeting, transmitted to the secretary of the Society, on the 10th instant, the correspondence which his grace had had with those noblemen, in reference to the site of the cattle show in 1851; his grace, at the same time, expressing a wish that such of the members of the Inspection Committee as were in town should take an early opportunity of waiting upon Lord Seymour, at the office of Woods and Forests, and of ascertaining from his lordship the conditions required by that department, in reference to a site to be chosen at Hampton Court, Bushy Park, or Kew, the localities which Lord John Russell had her Majesty's command to place at the disposal of the Society, for the selection of the site in question. His grace further requested, that after such interview with Lord Seymour, the whole Inspection Committee should be summoned to visit such locality, as might appear, under all circumstances, to be most eligible for the purposes of the society; in order that they might be prepared to report the result of their inspection to the Special Council, for deciding on the site, to be held on Thursday, the 20th inst.

Accordingly, Colonel Challoner, Mr. Villiers Shelley, and Mr. Brandreth Gibbs waited, by appointment, on Lord Seymour, on Saturday last; and they had the satisfaction to find that every disposition was felt by his lordship to promote the objects of the Society, and that the office of Woods and Forests would endeavour to agree to whatever conditions the Council might think it desirable to propose for the consent and confirmation of that department; his lordship suggesting that the Committee should, in the first instance, inspect a site of ground in Bushy Park, which he thought, in every respect, admirably adapted for the purposes of the show.

In consequence of this suggestion, the members of the Inspection Committee were summoned to meet in Bushy Park, on Tuesday last, the 18th instant, when Colonel Challoner, Mr. Jonas, Mr. Fisher Hobbs, and Mr. Brandreth Gibbs, Members of the Committee; Mr. Hudson, Secretary of the Society; Mr. Manning, Contractor of Works to the Society; and Mr. Stovin, General Manager of Traffic to the South-Western Railway Company, were met by Mr. Wilson, Clerk of the Works under the Commissioners of Woods and Forests, and conducted over the ground. Having made an accurate survey of that portion of the park to which Lord Seymour, after his own personal inspection, had directed their attention; and having taken into consideration its bearings in relation to the convenience of the public, the facilities it afforded to the contractor, and the supply of water for the cattle, the Committee agreed to the following recommendations to the Council:

I. That the open area in Bushy Park, bounded on the north by the public footpath, on the south and east by the running blank wall of the Queen's Paddocks, and on the west by the Lime-trees, being a firm level turf on sandy loam, and conveniently situated for the supply of water from the adjoining stream and ponds, the access of the contractor during the progress of the works, and the admission, at several entrances, of the public during the time of the show, whether arriving at either the Kingston or Hampton Railway Station, comprises a space of ground admirably adapted, in their opinion, for the purposes of the Society, from which to select a particular site for the show-yard, when the size of the yard required shall be known after the entries have been completed.

II. That leave should be requested—

1. To erect a pump for raising the water from the stream or ponds above the level of the show-yard, for the purpose of having it conducted by water-proof tubing, or otherwise, into the yard.
2. To allow the Society's contractor to convey his materials for the erection of the yard through the Hamp-

ton-Wick double carriage gates, near the Clapper Stile.

3. To make, at the Society's expense, a direct entrance from the Stud-gates (in the turnpike-road between Hampton Court Park and Bushy Park) through the wall of No. 15 Paddock into Bushy Park, immediately opposite to the contemplated site for the show-yard.

4. To be afforded facilities of free ingress, egress, and occupation granted on all former occasions to the Royal Agricultural Society of England by the great municipal corporations throughout the kingdom.

III. That his Grace the Duke of Richmond be requested, as the President of the Society, to enter into further communication with Lord Seymour, as Chief Commissioner of her Majesty's Woods and Forests, in reference to these recommendations.

(Signed) C. B. Challoner.
Samuel Jonas.
W. Fisher Hobbs.
B. T. Brandreth Gibbs.

On the motion of Mr. Brandreth, seconded by Mr. Kinder, this report was unanimously adopted by the Council.

On the motion of Colonel Challoner, seconded by Mr. Fisher Hobbs, a vote of thanks was passed unanimously to Lord Seymour, for the plans of Bushy Park, presented by his Lordship to the Society for the use of the Council. Colonel Challoner took that opportunity of explaining these plans to the Council; and of remarking, that the site in question was adapted in every respect to the purposes of the Society, being situated within a short distance from the three Railway Stations of Kingston, Hampton, and Twickenham, by which the show would be fed by visitors from every part of the country: in fact, that had the Society had the choice of the whole kingdom, a more advantageous site could not possibly have been found.

The report of the general Middlesex Committee was read and adopted.

The Council then agreed to resolutions having reference to the following points:—

1. That at the Hampton Court Meeting of the Society, in 1851, there shall be a Pavilion dinner for 2,500 persons, on Wednesday, the 16th of July.

2. That Saturday, the 17th of May, shall be the last day for receiving entries of stock for the Show.

3. That the week commencing Monday, the 14th of July, be the week of the Show.

4. That stock may be admitted into the yard at 8 A.M. on the Friday previous to the Show week; but must all be in the yard by 4 P.M on the Saturday.

5. That the judges make their awards on the Monday.

6. That on the Monday evening, after the judges have completed their awards, the public may be admitted at £1 each person; and governors of the Society, and members of Council, at 2s. 6d. each.

7. That the days of public show be—

(1) Tuesday, 5s.
(2) Wednesday, at 2s. 6d.
(3) Thursday, at 1s.
From 6 in the morning till sunset.

8. That on the Thursday the sheep hurdles shall have an extra upper bar screwed into them, for the purpose of protecting the animals from injurious handling by the public; and that a notice be put up on that day interdicting all attempts to handle the sheep.

9. That at 9 P.M., on Thursday, the stock may be allowed to leave the yard.

The Council then agreed to the regulations of the prize sheet, referring to the details consequent on these resolutions to the decision and arrangement of the general Middlesex committee.

The Council stands adjourned to Wednesday next, at 12 o'clock, when the Chev. Claussen will explain his process for the preparation of British cotton.

NEW MEMBERS.

The following new members were elected:—

Zachary Daniel Hunt, Esq., of the Old Bank, Aylesbury, and William Augustus Commerell, Esq., of Strood Park, Sussex, were elected Governors of the Society.

Ainslie, Rev. Robert, Tromer Lodge, Down, Kent
Balmer, Thomas, jun., Goodwood, Chichester
Baxter, Henry John, Brook-lodge, Cheadle, Cheshire
Bell, Matthew (High Sheriff for the county of Kent), Bourne Park, Canterbury
Bland, Nathaniel, Leatherhead, Surrey
Borton, John, Barton-le-Street, Malton, Yorkshire
Bramley, Charles, Westville, New Bolingbroke, Lincolnshire
Broadmead, Philip, Milverton, Somersetshire
Browning, Edward, Bulmer Kitchen Farm, Sudbury, Suffolk
Campbell, Alexander, Achindarrock, Argyleshire
Carden, Captain, 13, Cumberland-terrace, Regent's Park
Carnegie, W. F. L., of Boysarth, Kimblethmont-house, Arbroath, Forfarshire
Chapman, James, Tontine-street, Folkestone, Kent
Charlesworth, John Barff, 158, New Bond-street, London
Collins, George B., St. Colomb, Cornwall
Cornes, James, Barbridge, Nantwich, Cheshire
Dearsley, Henry Richard, 3, Plowden-buildings, Temple
Dennis, John Charles, Rosebrough, Alnwick, Northumb.
Dunn, Thomas, York-gate, Regent's Park, London
Erle, the Hon. Sir William, Knt., one of her Majesty's Judges of the Court of Queen's Bench, Park-crescent, Regent's-park, and Bramshot Grange, Hampshire
Evans, George, Wimborne, Dorsetshire
Firmin, Harcourt, Stratford-hills, Colchester, Essex
Garrad, Abraham, Colchester, Essex
Gonne, Charles, Warley Lodge, Brentwood, Essex
Gosselin, Martin Hadsby, Ware Priory, Herts
Gow, James, Fowler's Park, Hawkhurst, Kent
Hale, John, Fellcourt, East Grinstead, Sussex
Hamilton, William, Orchard Place, Canterbury
Helyar, William Hawker, Coker Court, Yeovil, Somersetshire
Hood, Alexander Acland, St. Audries, Bicknoller, Taunton
Howell, Francis, Ethy, Lostwithiel, Cornwall
Hulton, James Dott, Islington-hall, Lynn, Norfolk
Jackson, Thomas, Eltham-park, Kent
Kinglake, Arthur (banker), Taunton, Somersetshire
Langton, Capt. Edward Gore, Stapleton-park, Bristol
Lewis, Rt. Hon. Sir Thomas Frankland, Bt., Hampton-court, Herefordshire
Majoribanks, Edward, Fawley Court, Henley-on-Thames
Mangles, George, Givendale-grange, Ripon, Yorkshire
Maybery, Rev. Charles, Rector of Penderyn, Brecon
Morgan, Thomas, Maesgwrda, Laugharne, Carmarthenshire
Newton, Robert Pillans, Halyburton, Coupar-Angus, Fifeshire
Orde, Sir John Powlett, Bart., Kilmorey, Lochgilphead, Argyleshire
Peacocke, Warren, Tanhurst, Dorking, Surrey
Peel, Lawrence Henry, Llantstephan, Radnorshire
Pelly, John Henry, Oak Hill, East Barnet, Herts
Prosser, Francis Wegg, M.P., Belmont, Herefordshire
Rayer, William Carew, Tidcombe, Tiverton, Devon
Reynolds, James, Lea-bridge-road, Leyton, Essex
Rixon, Wm. Augustus, jun., Carshalton, Surrey
Sandford, Mark, jun., Martin, Dover
Savery, A. B., Hardwick-lodge, Chepstow, Monmouthshire
Searby, John, Foith Bank, Boston, Lincolnshire
Sergeauntson, George John, Camp-hill, Ripon, Yorkshire
Serrell, Sheffield, Leeson-house, Swanage, Dorsetshire
Sharpe, William, Copthall, Epsom, Surrey
Stephens, John, Wilton, Taunton, Somersetshire
Taylor, John, Burnfoot House, Wigton, Cumberland
Thompson, Frederick, Sheriff-Hutton Park, York
Toplis, James, Bernard-street, Russell-square
Trevelyan, Sir Walter Calverley, Bart., Nettlecombe, Taunton
Walker, Lawrence, 46, Welbeck-street, London
Webber, Henry, Park-hall, Bromsgrove, Worcestershire
Wilson, Stephen, Boakfield, Ballitore, Ireland
Yeoman, Thomas Lawrence, Richmond, Yorkshire.

ON THE PROGRESS OF AGRICULTURAL KNOWLEDGE DURING THE LAST EIGHT YEARS.

BY PH. PUSEY, M.P.

(From the Journal of the Royal Agricultural Society.)

It is a custom of many societies that the president should yearly review the progress made by them in their chosen field of research, recording any new facts which have been established, and pointing out those matters which appear to deserve and seem likely to reward their members' attention. Such a survey was attempted by me in 1842, when our society had counted but four years from its outset; and now in 1850, when our labours have lasted eight more years, the time seems again arrived for rendering some account of what we have done. If one were otherwise disposed to shrink from the task, the present state of English farmers would render it doubly incumbent. But the task is no easy one. Other scientific societies deal chiefly either with facts, as the existence of some hitherto unknown insect, or bird, or mineral, or even planet, or else with some supposed new law of nature, electrical or astronomical. Those facts are simple; those laws single. If the speculator fall into error, no harm ensues. But not so in agriculture. Our facts are not simple, nor our laws single. They vary with the climate, the soil, the seasons. What is true in Kent is not true in Sutherland. While, too, there is so much more exposure to error, the consequences of error are also more serious; for a reader will easily forgive a mistake as to the supposed site of some Roman temple, but may not so readily forget the expenditure of twenty pounds on a useless manure. Besides this variation in facts and in rules, another difficulty arises from the difference in the knowledge and skill of farmers. You need not recommend a turnip-cutter to a Norfolk farmer who has used it for years, and you will recommend it vainly to a Welsh farmer who has never seen the instrument or even perhaps had a turnip to slice. What is a truism here will be derided there as a crotchet. The experience, however, of our best farmers is the safest source of improvement, and cannot be passed over, though for such readers there may be nothing new in the statement. Lastly, at this particular time other feelings bias men's judgments; but however the cause of present distress may be viewed, the need for exertion to cope with it cannot be doubted; and agricultural improvement, which might hitherto be looked on as a hobby for a few country gentlemen, is now become the unavoidable business of landowners generally. These difficulties have been stated in order to obtain indulgence for the writer in his attempt to sum up the principal points of English agriculture. Such an account should clearly aim at containing what is true, not what is new, and avoid the blame of being fanciful rather than of being commonplace. I wish to embody in a short report the evidence of others whose writings have formed this Journal, not to obtrude any fancied discoveries of my own.

In taking this review I shall reverse the order adopted in the former survey, and say first a few words on the scientific rather than begin with the practical part of farming. My reason for the change is this:—The proper relation of science to agriculture has frequently been mistaken. It has been supposed that science, especially chemistry, was to guide and direct practical farming by conclusions formed on chemical grounds beforehand, and this mistake has not been without its effects. It is worth while then to consider the true relation of chemistry towards agriculture. Common chemistry teaches the action of substances upon each other, as of an acid upon an alkali, mixed in a vessel together. Organic chemistry endeavours to show the action of substances upon each other within the vessels of an animated frame, whether plant or animal; but the chemist does not say, because a mineral acid decomposes an organic salt, "I advise a gouty patient who has chalk stones on his fingers to drink oil of vitriol, and get rid of them." He knows that the powers of life are too complicated for him, and leaves diseases to be dealt with by the physician. The physician, a man who has studied the art of medicine, that is, the recorded experience of ages, knows practically that certain drugs have certain effects, and he administers them. But a few years since, when it was found that soluble flint is contained in wheat-straw, silicate of soda, a salt of flint, was advertised and sold for some time to farmers, that the straw of their crops might be thus strengthened, and the crops might not be laid any more—an evil experienced widely however this year. The chemist has aided the physician in a different way. The physician found the efficacy of a certain bark in fevers. The chemist has extracted from the woody fibre a white powder like sugar, which contains all its medical properties. So Baron Liebig has taught the farmer, who already *knew* that bones were good for turnips, how to treat those bones with sulphuric acid, and present the phosphorus to the young plant in a more digestible form. But eight years ago it was supposed that we must supply to plants in manure nearly all the mineral ingredients contained in their ashes. Thus Baron Liebig—(I mention an error of his, because his high reputation will not be injured thereby, and the warning may be useful to others)—that eminent philosopher, I say, prepared and sold under patent a manure containing the mineral ingredients of wheat so prepared as to be slowly soluble, and therefore to supply what the wheat wanted when it was wanted. Ammonia was omitted, because ammonia, it was thought, would be supplied by the air. The scientific manure was applied, but the wheat did not mend. The mineral theory then eagerly adopted was contained in the following axiom of Liebig's :—"The crops in a field diminish or increase in exact proportion to the diminution or increase of the *mineral* substances conveyed to them in manure." This doctrine received a deathblow from Mr. Lawes's experiments at Rothamstead, in the following manner :—Plants, it is well known, consist chiefly of vegetable matter formed of oxygen, hydrogen, nitrogen, and carbon ; the first gas forming water with the second, air with the third, and with the fourth substance carbonic acid, a gas largely diffused in the atmosphere. These then are the *organic* elements of plants. But further, the ashes of plants contain various minerals, potash, soda, lime, &c., combined with phosphoric and sulphuric acids in various quantities, and it was with these last, the *mineral* materials, that we were taught to build up our crops. Those indeed who were indisposed to extreme theories saw that two chemical bodies singled themselves out from all others by efficacy, namely, phosphorus and ammonia: the former, as superphosphate, seemed alone sufficient for turnips, but was also applied singly to wheat; the salts of ammonia, an organic manure as acting by its nitrogen, were applied not only to corn, but to roots also. It is necessary thus to recall past uncertainty that we may do justice to Mr. Lawes and Dr. Gilbert. Their experiments appeared in this Journal;* and the shortest extract only need be given here. Wheat was grown at Rothamstead on an arable field exhausted for the purpose, and the results were as follows :—

	Bushels of Wheat per Acre.
Unmanured	16¾
700 lbs. superphosphate	16¾
Eight lots with various phosphates; average	16⅝
Ash of 14 tons of farm-yard dung ..	16
14 tons of farm-yard dung	22

It is evident that on this exhausted land the heavy dose of superphosphate and the other mineral dressings did nothing at all. *They* might have been ill-selected, but the mineral contents of the *dung* did nothing; and this should be carefully observed, for the mineral theory lingers still among us, and it has been stated quite recently, in a popular lecture, that the slight mineral contents of a cartload of dung are all that is wanted by wheat. The effect, however, was clearly in the organic contents of the dung. This working power might be either in the carbon (charcoal or woody matter) or the nitrogen† (ammonia) of the dung. Unfortunately Mr. Lawes did not use ammonia singly, but he used it in combination with the following minerals, which we have seen to be valueless when standing alone :—

1. Superphosphate ..	635 lbs.	Sulph. ammonia........	65 lbs.	21¼ bush.
2. Various salts	619 ,,	Ditto	65 ,,	21¼ ,,
3. Ditto	619 ,,	Rapecake (*nitrogenous*) ..	156 ,,	22¾ ,,
4. Ditto	646 ,,	Sulph. ammonia........	80 ,,	26¼ ,,

The ammonia at once raises the wheat crop from 16 bushels to 21, that is to about the level of the dung; and as more ammonia is given, more wheat is grown, reaching 26 bushels, and surpassing what the dung can produce. These figures are conclusive that the action was in the nitrogen (ammonia) of the dung, not in its charcoal; and upon these experiments rests the now established doctrine that nitrogen is what white crops require. And it may generally be assumed for practical purposes that if ammonia be supplied to wheat, it will find the mineral ingredients for itself, either in the soil, or in past or present dressings; not that pure ammonia can be supplied, for pure ammonia is too dear—but all the manures practically applied by farmers to wheat hitherto are of a nitrogenous (*ammoniacal*) character, namely :—

Dung.
Sheep-folding.
Woollen rags.
Rape-cake.
Shoddy.
Sprats, &c.
Guano.
Nitrate of soda.
Seaweed.

Thus experience is borne out by science.

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* Lawes on Agricultural Chemistry, Journal, viii. 226, and viii. 494.

† Ammonia consists of nitrogen and hydrogen. The former constitutes its value. Where no precision of scientific language is necessary, it is sometimes more convenient to use the term nitrogen, and sometimes the term ammonia.

The Rothamstead experiments on turnips are far more complicated, but I will endeavour to make a fair selection. They were equally tried on exhausted land, and repeated on the same ground for three years, the turnips being drawn from the land. The produce per acre is as follows :—

Season.	No Manure.		Dung 12 tons.		Superphosphate of Lime.		Mixed Earthy and Alkaline Phosphates.	
	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.
1843	4	3	9	9	12	3	11	17
1844	2	4	10	15	7	14	5	13
1845	0	13	17	0	12	13	12	12

Here we find a result very different from the former one. The simple phosphorus which did nothing for wheat nearly equals the dung for turnips. But the mineral theory equally fails. For while 20 tons of turnips contain 45 lbs. of phosphorus, they contain 173 lbs. of alkalies, potash, and soda—so much indeed that they were classed in the alkaline family as specially requiring to be manured with alkalies; yet not only is the average crop produced by alkaline salts (*column* 4) the worst of the three—but the application of potash *diminished* the size of the bulbs, and Mr. Lawes observed that "by the direct supply of alkalies no good effect has arisen in the season of application: that they are rarely if ever requisite; and if ever, should not be applied in their *alkaline* condition."

Superphosphate, however, is slightly inferior to dung, and the question again arises as under wheat, whether this slight superiority of dung for turnips be due to its nitrogen or to its carbon. For wheat it was due to nitrogen (ammonia). For turnips, Mr. Lawes proves it to be due to carbon, the matter of wood. In the third year the unmanured portion was cross-dressed, as follows :—

Average Weight of Roots.

	No Cross-Dressing.	10 cwt. Rapecake.	3 cwt. Sulph. Ammonia.	10 cwt. Rapecake 3 cwt. Sulph. Ammonia.
No manure (third season)	·11	·67	·07	·50

Both rape-cake and ammonia are nitrogenous, but rape-cake contains carbon besides. Ammonia single does harm; while rape-cake, as in other cases, has been beneficial. Not even rape-cake, indeed, in dry weather is a safe neighbour for turnips. But carbon appears to be the distinctive active principle of dung for turnips. Here again our practice is borne out for the south of England. The dung is applied to the previous crop of wheat, which gets, what it wants, the ammonia, and leaves behind what it does not want, the woody fibre of straw (*carbon*), for the turnip-crop, which receiving also bones or superphosphate, is satisfied. Bran drilled in with turnips, containing phosphorus, acts like bones, as does also guano. The upshot of the whole is that, practically, so far as artificial manures are concerned, we need not dwell upon mineral ingredients, but must give ammonia to wheat, and to turnips phosphorus. Under what circumstances of soil or weather ammonia even injures turnips remains for further inquiry; for good farmers give them guano, rape-cake—nay, near Manchester, sulphate of ammonia itself; and a neighbour* of mine has raised fine turnips with sugar-dross, in which the blood, that is, nitrogen must be the active principle: so does also the important question, in what degree carbon (the straw of our dung) is beneficial to them. Though the mineral theory has passed away, it has left behind an indifference to carbon. Liebig, however, admits that woody matter, decomposing under a seed, feeds it until it can derive its carbon from the atmosphere. Boussingault extends this action to all the stages of growth. I am inclined to suspect that carbon, even in small quantities, is a much more active principle than we suppose. There is the case of bituminous clay improving a grass field in Wiltshire.* In Trinidad, decomposing mineral bitumen is said by Lord Dundonald to have a strong manuring effect. These act probably by their carbon; as also must oil, which is said likewise to fertilise. Water, too, containing carbonic acid, has a special effect upon grass.† The question, we shall see, has a vital bearing on the use of liquid manure. At present, however, we can only say that the three leading principles of manure are—

1. AMMONIA ;
2. PHOSPHORUS ; and probably
3. CARBON.

But a word may be said as to the preparation of these two cardinal elements, phosphorus and ammonia. Phosphorus in bones is sluggish and does not go to work. Ammonia is volatile and flies away. Now, to quicken phosphorus, Liebig has taught us to dissolve bones with sulphuric acid; a most valuable discovery. The acid is applied most conveniently to bones from which the gelatine has been burnt out, which is generally, I believe, done for other purposes; though bones have lately arrived from South America, ready burnt, for the convenience, I suppose, of carriage, but to the entire waste of the ammonia. But bones, if piled up wet in mould,* may be also in great part decomposed, and their action accelerated. This process is also in strict accordance with the laws of chemistry; for Liebig says—

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* Mr. Goodlake, of Wadley, has for two years tried this manure, at the rate of £1 3s. 6d. per acre, against twenty loads of dung. The rows being intermixed, and the crop quite level, it was only by pulling up the swedes we could ascertain how each row was manured.

* See Mr. Gowen's account of it, Journal, iv. 276.

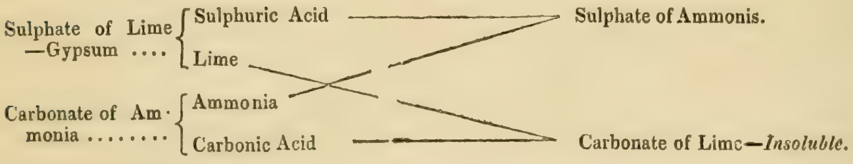
† See account of Swiss Water-meadows, in the Journal.

> "Bones become warm when reduced to a fine powder; and moistened bones generally heat and enter into putrefaction; the gelatine is decomposed, and its nitrogen is converted into carbonate of ammonia and other ammoniacal salts, which are retained in a great measure by the powder itself."

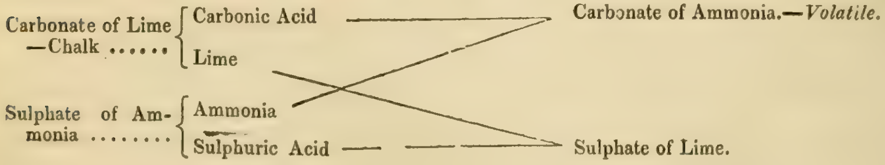
If mould be added, as I recommended, the ammonia will nearly all be retained, and goes into the earth in readiness for the next corn-crop. I should still use some superphosphate, because it acts quickest. But it sometimes seems to act even too quickly, leaving the turnip aground in the midst of its growth. The half-reduced bones, if drilled in a mixture, would then take up its work and finish the root.

To fix ammonia is the other great lesson taught by chemistry, and gypsum is often prescribed as the means. Ten years ago I tried gypsum for this purpose, but unsuccessfully. Ammonia was escaping largely from the litter of a farm-yard, as could be perceived by the common test of holding near the surface paper dipped in spirits of salt, which turns the invisible fugitive into a white opaque steam of salammoniac. A whole bushel of gypsum was strewed over a few square feet of the yard. The test showed that the escape of ammonia was uncured. We have been also advised to strew the pavement of stalls with gypsum to sweeten our stables. The remedy was applied in my own, but the stables were not sweetened. A caution concerning gypsum was therefore inserted by me in this Journal. Still it was said gypsum must be a fixer, because it is sulphate of lime; and if sulphate of lime be mixed with corbonate of ammonia, the sulphuric acid quits the lime, seizes the ammonia, and holds it fast as an inodorous salt. Accordingly, gypsum has kept its character to this hour as a "fixer," and farmers have been much blamed for not using it. Boussingault, however, throws a new light on the matter, though in discussing another subject.† He says that gypsum in *solution*, as in a laboratory experiment, does act as desired, but that in a state of *moist powder* the gypsum is indifferent towards ammonia; nay, more, that in that state the law of affinity is reversed, and that carbonate of lime (chalk) decomposes sulphate of ammonia, actually *unfixes* it. To explain this contradiction he quotes Berthollet and the following singular law: If two saline solutions, containing between them an insoluble salt, be mixed, that insoluble salt will be formed: but if two salts, containing between them a volatile salt, be mixed in a moist pulverulent state, the volatile salt will be produced. Thus, sulphate of lime and carbonate of ammonia in *solution* produce carbonate of lime insoluble, leaving sulphate of ammonia, which is soluble, though not volatile. But carbonate of lime mixed with sulphate of ammonia in a state of *moist powder*, acting by an opposite interchange, produce carbonate of ammonia, a volatile salt, and sulphate of lime. The following diagrams will show at a glance the contrary changes:

Solutions mixed.


Sulphate of Lime —Gypsum ....
Sulphuric Acid
Lime
Carbonate of Ammonia ....
Ammonia
Carbonic Acid
Sulphate of Ammonis.
Carbonate of Lime—*Insoluble.*

Moistened Powders mixed.


Carbonate of Lime —Chalk ......
Carbonic Acid
Lime
Sulphate of Ammonia ....
Ammonia
Sulphuric Acid
Carbonate of Ammonia.—*Volatile.*
Sulphate of Lime.

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* Pusey, On a new mode of preparing Bones for Manure.

† Boussingault's Rural Economy, p. 442, Eng. Edit.; see also Fownes's Elementary Chemistry, p. 195.

Gypsum, then, unless in solution, will not fix ammonia. But it requires to dissolve it 500 times its own weight of water. Therefore, when it is proposed that "every farmer should use a waggon-load of gypsum each year," we see that 500 waggon-loads of fluid are necessary to make that quantity act—a bulk of fluid scarcely attainable. Unless, therefore, gypsum find the requisite amount of liquid, which in a stable must be very doubtful, its action will be precarious; and again, how can we be certain that when evaporation takes place the process may not be reversed—be succeeded by the contrary action, as between salts in the state of powder, and thus the ammonia fixed in the yard be released again in the dung-hill? Green vitriol has been proposed; but Sprengel* proves it to be too expensive—"for 23lbs. of ammonia so prepared require 53lbs. of sulphuric acid, and 100lbs. of green vitriol contain only 29lbs. of sulphuric acid." Now, green vitriol or copperas costs from £5 to £6 per ton. The cost of sulphate of ammonia so made would be about £12 per ton, which price brings out pure ammonia at about 6d. per lb. Now when guano is at £10 per ton, the present price, the ammonia in that form costs only 5d. per lb.;† so that a former using green vitriol as a fixer buys of himself for *six* pence what he could purchase in the market for *five*. Of the so-called "fixers," then, gypsum is uncertain, vitriol costly, alum doubly so. There remains sulphuric acid, but this last may be reserved till we come to the treatment of dung.

The management of ammonia in the yard is still dark and difficult. Its management in the field is simplified by an important discovery of Mr. Thompson's,‡ which Mr. Way's§ experiments have greatly enlarged and diversified. If you pour a solution of ammonia on loamy soil, the water when it escapes below will be found free from ammonia. This action is not at all the same with filtration, for if a portion of soil be thrown into the liquid the ammonia equally disappears in a few minutes. There is, therefore, a chemical action, and it seems a new chemical action, reversing, as under the law of Berthollet, the ordinary conduct of chemical substances towards each other. The loam thus arrests, not ammonia only, but everything which can serve as manure for plants. Putrid urine sewer-water passing through loam, as Mr. Huxtable found, became pure as well as clear. Thus, a deep loam is enabled to retain manure committed to it until the future crop requires nourishment; an important discovery, limited indeed in its application, as Mr. Thompson candidly shows. For the soil must be *deep*, since dung is generally ploughed in four inches deep, and twelve inches at least of soil should be under the dung to secure "absorption." It must be a *loam*, too for sand has not this property.

Such are the scanty lights thrown lately by chemistry on the culture of crops, but the principles on which animals are nourished have been suddenly brought into full day by the brilliant discoveries of Baron Liebig. That great chemist has shown that the stomach of animals does not compound their flesh from the ingredients of their vegetable food, but finding that flesh ready formed in the corn or hay, merely selects and appropriates it. This substance, called gluten or albumen, resembling the white of an egg, is found generally in food. "Chemists," says Dr. Playfair,‖ "were surprised to discover that this body never varies in composition, that it is exactly the same in corn, beans, or from whatever plant it is extracted. But their surprise was much increased when they remarked that it is quite identical with the flesh and blood of animals. It consists of carbon, hydrogen, nitrogen, and oxygen, and in the very same proportion in 100 parts. So much so," he goes on, "that if you were to place in a chemist's hands some gluten obtained from wheat-flour, dry albumen from an egg, a fragment of the flesh of an ox, or of dried blood, he would tell you that they are precisely the same." He adds the following analyses:—

	Gluten from Flour. Boussingault.	Casein from Peas. Scherer.	Albumen from Eggs. Jones.	Ox Blood. Playfair.	Ox Flesh.
Carbon	54·2	54·138	55·000	54·35	54·12
Hydrogen	7·5	7·156	7·073	7·50	7·89
Nitrogen	13·3	15·672	15·020	15·76	15·67
Oxygen	21·4	23·034	22·007	22·39	22·32
	100	100	100	100	100

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* On Animal Manures, vol. i. p. 470.

† Way, on Value of Guano. *Journal*, vol. x., p. 225.

‡ On the Absorbent Power of Soils. *Journal*, vol. xi. p. 68.

§ On the Power of Soils to absorb Manure. *Journal*, vol. xi. p. 313.

‖ Applications of Physiology to the Rearing and Feeding of Cattle. Journal, vol. iv., p. 215.

Analyses not differing from each other more than the analyses of the same substance usually do. The gluten or casein of the flour or peas, which we may call fibrine, taken into the stomach, and thence into the veins, becomes blood, and the blood passing from the veins becomes flesh, without change, just as a house is built up with stones from a quarry. The muscles of the ox are woven invisibly from the fibrine of grass, as linen visibly from the fibres of flax.

This is an undoubted truth, and a great discovery of Liebig's. Another discovery is so well known that it need only be mentioned. Besides fibrine, which becomes meat, vegetable food contains other substances—gum, starch, sugar. All these are without nitrogen, and consist of charcoal (*carbon*), with the elements of water (*oxygen and hydrogen*), that is of the substance of wood. Liebig has shown that in the animal body they are used as wood, being absorbed, combined with oxygen, and exhaled as carbonic acid. In the words of Dr. Playfair, "The body is the furnace—the food is the fuel—the excrements are the ashes—and the gases exhaled from the mouth are of the same composition as those which fly up the chimney of the furnace." If, then, we want an animal to lay on meat, we give him beans, which abound in fibrine, and chopped straw for fuel, just as we ourselves eat beefsteak and potatoes. Animals seem to know this by instinct, for my shepherd tells me it is useless to give the sheep chaff in their troughs until cold weather comes on. As the winter deepens they eat more chaff; but in spring they gradually leave it off, till in May they refuse it, as we light our fires at Michaelmas and leave our grates empty in May. So far, all is clear; but an unfortunate doubt remains on a point, all-important too in feeding cattle, namely, the source of fat. According to Liebig it is the surplus of the starchy matter in food, which, not being wanted for fuel, is not consumed, but deposited in the body ready for future use. Dr. Playfair compares it to the consumption of coal in a gas retort, where, if there be not air enough present, a part of the coal instead of passing off as gas is left behind as coal-tar. The tar formed in this case, says that agreeable writer, represents the fat of animals. If this be so, we have only to supply our fatting hogs with food full of starch, like potatoes. But the greatest agricultural chemist, Boussingault, takes a different view altogether. He denies that fat is ever produced in the animal frame from starch. He shows that the food of cattle contains a third substance—vegetable fat—and is positive that as the flesh of animals exists already formed in their provender, so does also their fat, and so also does the butter contained in their milk. On the latter point he brings this proof, that a cow, namely, being fed on mangold-wurtzel, alone, which contains little fat, gave but little milk, and that milk poor, but recovered her milk on receiving straw in addition, which, little as we should suppose it, contains vegetable fat. Since fat is the object principally aimed at in preparing stock for the market, the muscles or flesh having often, I suppose, attained their full size when the beast is put up to feed, it is evident that, until the source of fat be determined, organic chemistry being undetermined itself, can give no certain judgment on the final feeding of stock. I mean that we can have no reliable tables of the comparative virtue of different kinds of food; because, if Liebig be right, there must be two columns of figures, 1, for the ingredients of flesh, 2, for those of fuel and fat jointly; but if Boussingault, Dumas, and the French school be right, then we must consider each article of food under the three heads of flesh, fuel, and fat distinctly. There is one point, however, certain—the importance of warmth. Wherever fat come from, there is no doubt that both fat and flesh are wasted from the production of beef in an animal frame suffering by excessive cold. The substance of an animal pining from cold evaporates with the breath, as the spirit would pass from wine in an uncorked bottle. The comfort of our stock, therefore, is in unison with their master's profit. As to their food, practice, as Boussingault himself, no mean chemist, frankly says, "has got the start of theory; and I own," he adds, "with perfect humility, that I think its conclusions are in general greatly to be preferred." Still, animal chemistry has made great advances, and does at least *explain* much. Of vegetable chemistry as much can scarcely be said. In the words of its able exponent, the late Dr. Fownes, speaking at the premature close of his labours, "The chemistry of vegetable life is of a very high and mysterious order, and the glimpses occasionally obtained of its general nature are few and rare."

It seems at first strange that the chemistry of the lower form of life should be more backward than of the higher—that vegetable nutrition should be darker than animal; but Liebig's discoveries afford us a reason. Animals, he has proved, find much of their substance ready made in the vegetables which they consume. Besides, animals and vegetables belong both to organic chemistry. The two substances are, as it were, of the same realm, subject to the same laws. But vegetables have the task of transmuting the dead elements into living matter. They bridge the gulf between the mineral and the organized world. Now this union has not yet been effected between the two kinds of chemistry. In mineral, or more correctly, inorganic chemistry, if we can decompose a substance, we can generally also compose it. If we can sever water into its two gases, we can form water again by uniting those gases. But we cannot deal so with oil: we can only unmake it; we cannot form it anew, by blending its elements. That task is left to the hidden powers working in plants. Again, ammonia, the very substance we prize so highly and purchase so dearly, is compounded of two gases, very common and very attainable; for one of them, hydrogen, forms one-ninth of all water, and the other, nitrogen, three-fourths of the very air that we breathe. Yet, because organic chemistry cannot put together these two gases, in which all nature lives, and so form ammonia, our ships are compelled to double Cape Horn and fetch guano from the Pacific Ocean. If, then, we cannot compound the simplest organic substance, by mixing its two or three lifeless constituents in our vessels, being thus confessedly ignorant of the laws under which they combine, what wonder that we should be unable by any chemical reasoning to perform the same task in the garden or in the field? It seems reasonable, therefore, that we should earlier scan the laws of vegetable than of animal nutrition; understand, that is, the food of beasts sooner than the food of plants.

The mineral theory hastily adopted by Liebig has broken down; no other has taken its place. Our best authority, Mr. Lawes, has established certainly so much, that of the two active principles in manure, ammonia is specially suited to corn, phosphorus to turnips, and that turnips are *probably* benefited by the woody matter of straw. But vegetable chemistry, having no fixed truths of her own as to the sources from which plants derive their food or the mode in which they appropriate it, is not advanced enough to lay down laws for farming, or sit in judgment on its established practices. Except Liebig's suggestion for dissolving bones with acid, and Sir Robert Kane's for using flax-water as manure, I know no agricultural process arising out of chemical discovery. The more we value the labours of agricultural chemists—the more warmly we look forward, as I do, to their future progress through the patient examination of existing practice, which is itself the accumulated and varied science of ages, the more we should discourage undue expectations of immediate advantage. It is a great mistake to suppose that men can be made farmers by teaching them doubtful chemistry. But are we, therefore, to abandon agricultural chemistry because it is yet doubtful, and has not yet brought forth more fruit? Rather let those who are able cultivate it the more diligently by careful experiments, that step by step we may reach more certain knowledge hereafter. No one, meanwhile, can doubt the high value of Mr. Lawes's experiments in the field, or Mr. Way's* researches in the laboratory. I should not have said so much, but that the public are sometimes led by a false estimate of chemistry to undervalue our real progress in other sciences, as in mechanics, and to overlook the true knowledge of our practical farmers. Before we pass to these, however, I must endeavour to do justice to our advance in what seems the most uncertain of all sciences—

METEOROLOGY.

Much light has lately been thrown on climate; and our own, which was once so much complained of, is found to be the best in the world for healthful exercise, and, as I believe, for farming also: because it enjoys the most temperate summer, combined with the mildest winter, and, on the whole, a steady downfall of rain. No one can have returned from Calais to Dover without admiring the refreshing verdure of the English downs. This we owe to our frequent showers, to our clouded sky, shielding off the scorching sunshine, and to invisible vapour diffused in our air. The excess of vapour is shown by the difficulty of growing in French greenhouses the heath, a plant requiring moist air and the difficulty of working the English electric telegraph. This moisture arises partly from our neighbourhood to the sea on all sides, partly to the prevalence of western winds arriving from a wide ocean. Hence comes our grazing husbandry. Our equable distribution of warmth through the year gives us our peculiar farming—mixed husbandry; the extensive growth of roots upon corn-land producing meat largely as well as bread, the maintenance of stock thus supporting the production of corn. If our summers were hotter, we could not grow turnips; if cooler, they would not ripen wheat. If our winters were colder, turnips would perish. Our forefathers, indeed, did not practise root-husbandry. On the eastern side of England they took two corn crops and a naked fallow, which is the three-course shift still lingering in Cleveland, and prevailing in Prussia. This is the corn side of England. On the west side you may still find in secluded parts of Wales, or in Devonshire, three or four oat crops grown in succession, and the land left as many years covered with grass. This is the grassy side, and though the turnip has now overspread England, one side of the island is still best suited for corn, the other for herbage. This difference of produce rests on a difference of climate, the causes of which are well understood, but are found in very remote parts of the globe. Heat and cold, long continued, accumulate in regions removed from water, because the land there becomes constantly hotter or colder whilst the influence of the sun remains strong or weak, and the wind from the sea, which varies less in temperature, scarcely reaches these inland tracts to mitigate the fierce extremes. Hence the coldest part of the old world is in the centre of Siberia. As you recede from that point westward you approach the sea, and hence in winter our cold comes with north-east winds from Siberia, the great deposit of cold. But we have happily a distant yet effective source of warmth also in the Gulf of Mexico, from which the gulf stream washes our western shores. This great warm-water apparatus of nature, passing even beyond us, stretches northward of the North Cape of Europe, and there, accordingly, though so near the pole, the coldest wind of winter comes actually from the *south*-east. Hence, as is shown in the extract from Professor Dove's chart, given in this number, the line of equal cold during December runs in Great Britain due north and south. Hence, the meadows are brown in Essex, while the grass grows till Christmas in Devonshire. Englishmen, indeed, do not know the mildness of an English winter. London, though on the cold side of England, is less cold in January than Paris or Milan; and though they go for warmth to the south of France or to Italy, deserted Mayo and Connemara, and the shores of Killarney, covered with arbutus, are warmer than Montpellier, or Genoa, or Florence. Such is our winter climate. But as spring advances a new cause of warmth arises. The sandy deserts of Africa and Arabia, gathering heat, begin to glow like a furnace, and dart warmth northwards across Europe. Germany lying nearer to the centre of this burning wilderness becomes warmer than England, which is now also cooled comparatively by the sea that warmed it before. So that whereas in winter the more you advanced east towards Russia the deeper became the snow, now you find it more and more sultry. Hence, hock is grown in the latitude of Cornwall. The lines of equal temperature now run up in the map to the north-east. Stockholm and Petersburgh in June are as warm as London. Hence, the east side of England, being the warmest in summer, is the best side for wheat. But, besides the mild winter on one side, and the warmer summer upon the other, there is a yet greater difference as to moisture visible and invisible. In Devonshire you find fern growing on the limbs of the oak, and oaks themselves thriving on the top of high narrow hedgebanks. The air, though clear, being moist, probably absorbs less water from the surface of leaves, which therefore require a less supply of water through the roots. The difference, too, as to visible moisture, rain, is very great indeed; for, the westerly winds arriving from the warm gulf stream, charged with vapour, are chilled by the land and part with that vapour in rain. If they strike a hilly land (and our western coast is almost mountainous) the air is driven up from the level of the sea to a higher and colder region, and parts with yet more rain. Accordingly, taking 29 places* on the east side of the island, we find the yearly downfall to be 25½ inches: and at 29 places on the west side to be 49 inches, all but double; while on the Cumberland mountains it reaches the enormous amount of 121 and 147 inches. In Northumberland, when a south-wester blows, they know, I was told, that it is raining torrents in Cumberland, 50 miles off, but they get none themselves, because the air has been dried in rising over the mountain tops.

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* See Mr. Way's excellent paper on Guano, Journal, vol. x., p. 196.

What then is the practical inference for agriculture from these undoubted facts, established by science? Caution in laying down general rules. We now see why a Scotch farmer often fails in England, or a Suffolk farmer even in Cheshire. Again, if a landowner desire to improve his estate in the West Highlands or Galway, he must look, we see, not to Lincolnshire or Aberdeenshire, but to some district of kindred moisture. There is, however, a more definite inference to be drawn even than these. How can a fixed rule be laid down for the depth or the distance of drains or the size of the pipes, when one county has 25 inches of rain and another has 50 inches to be carried off by those drains? The difference is in fact, more than this; for a large part of the downfall returns to the air from the surface. According to the most recent and trustworthy experiments published in this Journal by Mr. Charnock, out of 33½ inches of rain, no less than 25 inches are evaporated, 8½ inches only reach a depth of 3 feet, and therefore pass through a drain. This was in Yorkshire. But at Kendal there fall 54 inches of rain. The evaporation there, however, would be not more, but less, because the air being moister must dry what is exposed to it more slowly, and the evaporation would not exceed, probably fall short of, 21 inches. There remain, therefore, for the drains 33 inches' depth of water in this case, 8½ inches only in the other—four times as much in Cumberland as in Yorkshire. Yet, hitherto, if a man living in Oxfordshire said that 1-inch pipes would drain his land well, a voice from Ayrshire might exclaim that it was absurd to use less than 1½ pipes, which he found far the best. Yet, the smaller pipe might be more competent to its duty in one place than the larger one in the other. The same thing may be said of farm-yards. Living in one of the driest counties of England, I adhere to the old fashion of making muck in farm-yards. This was somewhat blamed by a northern writer, whose talents I sincerely respect. At the very time, however, we were obliged to use a fire-engine to moisten the litter, which was growing white and mouldy for want of moisture. When it rains here in winter, our labourers say, "This is fine weather for making dung." Henceforth, in speculations on the agriculture of the country, we must never lose sight of our material variations in climate.

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* I have taken the places given in Mr. Whitley's paper, Journal, vol. xi. p. 13.

AGRICULTURAL MECHANICS.

This is certainly the branch in which the increase of knowledge has done the most good to farmers, that increase being partly extension, partly advance. Ten years ago it was shown by me in this Journal, that even in the same parish on the same soil, one farmer's plough was heavier for three horses than the other farmer's for two. In many parts of England you might then see three horses ploughing light loam: such a thing could scarcely be found now. It appears from official records that the number of agricultural horses has been greatly diminished in the last few years. The account* of the number of horses claimed as "wholly exempt from duty," as being kept and used solely for the purpose of husbandry, stands as follows:—

Year.	Number of Horses.
1840	371,937
1848	297,858
Decrease	74,079

Now as more land was certainly broken up during that time than has been laid down to grass, I can see no other cause of the decrease than the reduction of plough-teams; and if so, putting the expense of each horse at only £10 a-year (though it is set sometimes at £20 in those fanciful statements, the estimates of farm expenses), we get three quarters of a million saved yearly to the farming body at large. I believe that two-horse ploughing can be carried no further; it is a mistake to suppose that clay land can be worked by two horses abreast, one of them stepping on the whole land and poaching it at every step; and it is far better that three or four horses should draw at length in the furrow. But there is a similar change which gives a yet greater saving of horses, which has been proved to do so over and over again in this Journal, which might be used almost everywhere; but about which farmers have been, to say the least, rather slow: I mean, of course, the exchange of waggons for carts. In Northumberland light carts with a single horse are used for all farming purposes. In Bedfordshire they have light carts too. In the south we have well made waggons; but with three horses. The Lincolnshire waggon is like a railway-truck on the broad gauge. I will not again describe the trial in which five of my horses with carts beat ten horses with waggons at barley cart, the number of men being the same; but here is another trial which has just taken place, with the same numbers and the same issue, on the challenge of Sir John Thorold, at Grantham, this year.

"The trial was made to-day (Aug. 27), in a field of mown oats on Mr. Fisher's farm. The extent of the ground cleared is twelve acres; the crop was a heavy one, and the distance from the stack-yard is a mile and a quarter. On the way, the river Witham is crossed by a ford, and the approaches on either side are steep and almost frightful. As in the former case, the men and boys were equal on both sides, and the number of waggons and of carts on either side was *five*. The *horses* used in the carts were FIVE, while those used in the waggons were TEN. The time occupied in clearing the ground was four hours and three-quarters. *Both parties began and finished together*, and it was found, by measurement of the stacks, *that the carts had conveyed about two loads more than the waggons.*

"The trial of last week proved favourable to carts on *level* and *up-hill ground*; while this day's result is equally favourable for both *up-hill and down.* In going down to the river, it was found necessary to lock a wheel of the waggons, and to arrange the horses so as to allow of an additional leader in going up; while the carts went straight on, without stop or change of circumstances."

The saving of horses by the use of Northumberland carts, it is now quite clear, is one-half. What is the saving of outlay at the wheelwright's on entering a farm? I have obtained the prices of the old conveyances from a village wheelwright; they are as follows for a farm of 200 acres:—

Old system.

	£	s.	d.
3 waggons, at £35..............	105	0	0
4 three-horse dung carts, at £14..	56	0	0
	£161	0	0

New system.

	£	s.	d.
5 one-horse carts at £11 10s. ...	57	10	0

so that the new plan costs but one-third of the old-fashioned outlay. The carts are Busby's prize carts, suited for all purposes: easy for the horse, as the wheels are rightly made; easy for the labourer, as they are much lower than other carts, and wonderfully cheap, as they cost but £11 10s., while for my own I paid £18 18s. a few years ago. Here, indeed, since farmers have compared the two systems, no one buys waggons in stocking a farm; but those who have waggons do not like to buy a new set of carts. I should say they had better sell their waggons while they can; and if they cannot, make a bonfire of them. To use them still, is like running a stage-coach in these days between London and Bath. Altogether we must admit, that though thousands of new implements are sold every year, the farmers in some counties are tardy in enlarging the old circle of plough, harrow, and wooden roller. There is Crosskill's clod-crusher, which reduces, as its name imports, cloddy land. Sometimes a field is kneaded by sheep on turnips in wet weather, and ploughs up in brickbats, among which barley cannot be sown. I have seen women employed to break them with sticks. A clod-crusher would do it at once, costs but twenty pounds, and lasts for ever. It is the best presser for a honey-combed wheat-field in spring, as the dents from its teeth, like the footmarks of the sheep, stop the course of the wire-worm. A grubber, too, such as Biddle's, or the Uley cultivator, covers with its tines the width of eight ploughs, requires but six horses instead of sixteen, and on some occasions does the work as well or better. Drills are become pretty common in farmers' hands; they are greatly improved, and perhaps the only improvement still required in them is a reduction of price. Among these, the most striking novelty is Chandler's water-drill,* which bids fair to remedy a great evil for southern farmers. Often when our land in July is ready for the turnip-seed, on the success of which depends our flock's subsistence in winter, that land is as dry and dusty as a turnpike road. We watch vainly every cloud, and in vain set our weather-glass. Weeks pass without rain, or worse still, a shower falls, but we find that the rain has not entered the ground. This drill, however, deposits along each line of seed enough water, which serves also as a vehicle for manure, such as superphosphate, to start the young plant in readiness for the coming change of the weather. It is used extensively by practical farmers in Wiltshire, and bids fair to remove for the root crop one of the farmer's peculiar obstacles—uncertainty: to remove which, if there be a leading object of improvement in agriculture, is the main object. There is another implement, however, for turnips—the most beautiful, I should say, in its work, of all the new implements—I mean Garrett's horse-hoe. It is a good plan in the south of England to sow the seed in four rows at once, with a corn drill which covers six feet in width. But when the turnips are up, the difficulty often is to get them hoed, the hands being busy with harvest. This horse-hoe is made to cover the same width, so as to follow any swerving of the drill, each of the hoeing-knives works independently; the holder, by help of a steerage, drives fearlessly through the surface of foliage, though the leaves almost meet, and you may afterwards see the green surface lying in bands of dark green or of grey, as the leaves have been laid from the spectator or towards him. The same implement will even hoe wheat, though the lines of plant be but seven inches apart, and the row of knives passing along threaten total destruction. For a field operation, it is as delicate as the action of the revolving knives with which the loose threads are shorn from the surface of broadcloth at Leeds. I have had Garrett's horse-hoe long, and wonder that any south country farmer who knows it should be without it. It must be made to fit the width of the drill. It is marked, I see, at £18 only. These new implements would not all together cost the difference between the price of one-horse carts and of the waggons, in buying which we purchase the privilege of using ten horses where five would do better. Again, why is the horse-rake, a cheap implement, used generally to despatch the harvest in one county, unknown or disliked in another? A good paring plough has long been wanted to scarify the stubbles in September. We have now a perfect one—Kilby's, which won the prize at Norwich and Exeter, costs but £5, and pares the land as true as a breast-plough, twice the width of a common plough, yet drawn by two horses only. Such are a few of our principal field-implements. In yard-machines, too, mechanical science has helped us greatly. Without trespassing on our excellent implement reports, I may cite the moveable steam-engine, which has this great advantage over a fixed engine, that the fixed engine requires all the corn to be brought home to one central yard, be the farm ever so large or ever so irregular in its form; now two miles out and back at harvest and dung-cart are a serious increase of horse-work, and every large farm, therefore, should have a field-barn, to which the engine itself may travel. A small farm, again, cannot keep a fixed engine in work. It is most convenient when a corn-rick is to be threshed in a hurry, or a straw-rick to be cut up for sheep, that steam-power should be at your command, to be had for the hiring. Accordingly, fifty moveable steam-engines, at the price of £200 each, were sold in the following year by one exhibitor at our Norwich show. Their improvement is manifested by the single fact that our prize engine at Exeter consumes but one ton of coals in the time during which a prize engine of former years requires four.

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* It should be stated that as the claim for exemption is not compulsory, it is possible that fewer of the horses actually kept may have been returned, but there is no reason to think that this has been the case.

But, apart from steam-power, there is a surprising difference in the amount of work done by common threshing-machines worked by four horses. It would be unfair, of course, to compare the corn threshed in a barn with the result of the race at our annual trials. But I have reason to believe that the ordinary work of the best machines in the barn, striking an average of the yield from the straw, which varies, of course, at different harvests, is from 30 to 40 quarters of wheat per day of eight hours; yet I never could find from any farmer in my own neighbourhood that he could get from our common threshing-machine more than 10 to 15 quarters in the same time. I have seen it stated, too, that in Middlesex one of Messrs. Garrett's threshing-machines was found to double the work of the common machines of that county. Clearly farmers should look at once into this monstrous difference of their machinery—a difference which could not exist two years at Manchester. The threshing-machine, too, is now made to do more than thresh: it separates the straw, and, further, winnows the corn so far that a single dressing is afterwards sufficient to fit it for market. All this, Mr. Garrett informs me, may be done with his steam-driven threshing machine at 1s. to 1s. 3d. per quarter; by hand it would cost certainly from 3s. to 4s.; so that here we have a saving of 2s. per quarter, 7s. on every acre of wheat. The quality of the threshing itself is greatly improved. To this day, in some (perhaps most) districts, maltsters will not buy machine-threshed barley, because so many grains are bruised by our old machines, and their germinating principle destroyed. Farmers generally ought to know that this objection has been entirely overcome within the last few years, and that in Essex, as I am told—no mean district for malt—the maltsters are even beginning to buy machine-dressed barley by preference. In hand-threshing barley there is not only great delay in preparing any quantity for the market, but there arises a serious obstacle for one of our great modern improvements—the cutting up the barley-straw into fodder for sheep, into chaff, as it is called. The thresher, of course, gets through but a small quantity of barley in a day's work, and the straw is heaped up gradually in the yard, where it is often spoiled by occasional showers. The machine completes a rick in a day or two; and one of our new chaff-cutters, worked by a horse, in a day or two more will cut up the loose straw into chaff, which, mixed with a little cake, is quite equal to hay. Nothing shows the progress of our machinery better than the process of cutting straw into chaff. Ten years ago it was done in a trough, with a chopper at the end, lifted up and pressed down by a man, who was paid for it at the rate of 2d. for a six-bushel basket. Then came the various chaff-cutters with circular knives, still worked by hand. With these I used to pay 1½d. per basket—three-fourths of the former price; but, putting a horse to the chaff-cutter, I find a far greater reduction, for we cut at the rate of 544 baskets per day. The account stands as follows:

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* See commendations in Implement Report.

	s.	d.
Eight women yelming, *i. e.* straightening the straw, 8d.	5	4
Six men, 16d	8	0
Horse, say	2	6
Boy	0	6
	16	4

The cost comes out, instead of threepence, about a farthing and a-half; and as Mr. Corne's new chaff-cutter dispenses with the women yelming, we may safely set down the basket of fodder at a single farthing, instead of twopence—one-eighth only, therefore, of the cost incurred here twelve years ago. I cannot quit machinery without adverting to the deep obligation under which we all lie towards the gentlemen who, year after year, devote days of minute attention and hard labour to our trials of implements. To their reports the reader must turn for accurate information on the implements mentioned and on others, as the various crushers contrived for the economical use of food.

Medical science, too, has been applied to the diseases of our cattle by Professor Simonds; and no one can doubt, none at least who has felt the losses of live stock, that we shall gain much when we get our stock out of the hands of the farrier, and cow-leech, and pig-doctor. But I must hasten on, and proceed at once to

THE IMPROVEMENT OF LAND.

Ten years since, nothing struck me so much as the varied means possessed by the owners of land in England for raising, permanently, the productiveness of their estates. In no country are those means so various. Scotland and Flanders are monotonous in contrast with England. In none has so much been effected. And after ten years' labour the same thing still strikes me forcibly. It is on these recognized practical improvements that our dependence, I firmly believe, must be now placed. Not only, too, have we these *varied* means, but most of them are very *cheap* means. They would average three or four pounds an acre, and the crops are increased by them, be it remembered, without increase of the tenant's outlay. I know no other safe investment in which moderate expense produces so large a result of *profit* as in many of these permanent improvements of land. At the present time, however, the landlord's anxiety is to avoid permanent *loss* of income. He should, therefore, raise the productive power of each farm; and there are very few farms on which the owner, consulting with the tenant, may not find some effective and cheap improvement to make. We may begin with

§ 1. *Draining.*

No one now doubts the advantage of draining; but sometimes, unfortunately, the doubt exists whether it can be done—that is, whether you have an outfall. In Ireland this matter has been attended to by the Board of Works, and the rivers or brooks have been deepened in order to secure outfalls to each property. It is called there arterial drainage—an absurd name, importing the reverse of its objects; since arteries convey their fluid into small channels, whereas these main cuts carry theirs off. Trunk drainage it should be called. In England vast operations of this kind have been effected by private enterprise, especially in the Great Level of the Fens, where 600,000 acres,* some of them below high-water mark, have been drained by cuts and windmills, and steam-engines, and now are in a fair way to gain a natural outfall. But no one can have looked from a railway (railways generally following the lowest level) without observing many flat tracts where the water fills the ditches to the brink during the three winter months. The fenmen have just paid £150,000 for an additional fall of 11 feet in 30 miles, and have agreed to contribute £60,000 more towards the new works in the Wash, merely for the benefit which will arise to their drainage. Elsewhere the same fall might be gained in three miles for £150, and for the want of it the fields cannot be underdrained.

What is most difficult is thus often done first, because less amount of evil is not enough to overcome a far smaller obstacle; and so, as in this last common case, the supineness of all, or obstinacy of one, prevents all improvement. An act was carried by Lord Lincoln, enabling the majority of a district to overcome such resistance. I mention the fact because its existence is scarcely known, though trunk-drainage is a very general want in many parts of the country.

Under-drainage has been used in England since the great rebellion, as Lord Braybrooke has shown has long been a common practice of our Eastern counties, and received a new impetus from the late Mr. Smith, who coupled with it subsoil-ploughing, a practice which, in his rainy county, was probably right on certain soils; but which, on the dry side of England, is Ibelieve frequently useless, especially on our strong clays, where the clay in three or four years completely closes again. On the other hand, where there is a pan to break through, subsoiling is sometimes enough without any draining. Up to this time the depth of drains was under three feet. It is to Mr. Parkes we owe the improvement of sinking them to four feet or five; and it does not detract from his merit if, as I believe, his rule upon the strongest clays suffers exception. I shall not enter on that debateable ground, but it is equally certain that shallow drains have been taken up, to be replaced by deep drains, and deep drains in other places been superseded by shallower ones. Draining, at whatever depth, for some years known to be profitable, is now indispensable, being only checked by want of means; and well it is that the cost of materials is so greatly reduced by tile-machines, which can deliver their goods like the new printing-press of the "Times," at a score in a minute—that instead of paying for tiles, as I have done, 90s. for 1,000 feet (60s. for tiles and 30s. for soles), we now get 1¼-inch pipes for 15s.—one-sixth of the former cost. Mr. Hodges' temporary kiln, too, should not be forgotten, which cost him £5 only, has been used for six years, and will at least bring an unreasonable tilemaker to reason. Still we hear estimates of £5 or £6 an acre for draining, and that over a whole farm. The fact is, that we are too systematic in draining, especially when the work is begun upon a grand scale. The source of economy now must be in the maxim that "*one drain well laid to suit the circumstances will often save a dozen by rule.*"† Instead of saying that a whole farm shall be drained at 24 feet interval, unfold your plan as you proceed. When the outfall ditches are cut, you may find gravel bottom instead of clay; and a swamp of 40 acres may be drained, as was my own case, by an open ditch that cost £20. Money is often wasted in over-draining. I speak from experience. In the same field there may be clay on one side requiring 30 feet interval, and loam on the other, where drains at 45 feet will be ample. To prove this I may give a few figures of the sums I am paying this very November for drainage at different depths and intervals upon strong land:

Depth in Feet.	Labour per Pole.	Interval in Yards.	Cost of Workmanship per Acre.			Cost of Pipes per Acre.		Cost per Acre.		
	d.		£	s.	d.	s.	d.	£	s.	d.
5	4½	11⅔	1	8	4	17	3	2	5	7
4	4	11⅔	1	5	0	17	3	2	2	3
3½	3½	11⅔	1	2	0	17	3	1	19	3
3½	3½	15	0	17	0	15	0	1	12	0

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* For a full account of these vast operations, see Mr. Clarke's Prize Report, Journal, vol. vii. p. 80.

† From the Prize Report on Somersetshire.

A few shillings must be added to each sum for the main drain. These drains are in a clay subsoil, and clay is often the cheapest to drain, because it is easiest to work with the proper tools, but then a gravelly subsoil draws farther. The breadth of the ridges is a good guide to the right interval between the drains; for our forefathers shaped them to the quality of the soil. A drain, then, in each furrow will generally be enough; nor where the ridges are high would I attempt to level them. The crown of the ridge is long in recovering, the draining is less effectual; and besides, after all, the farmers are right in saying that more can be grown on a sloping surface than on a level one, that is, with an *equal depth* of soil; for the number of plants depends on the allowance of space to their roots.* Again, it has been said of late that drains should always go straight up and down hill. This is true, I believe, where the water to be drawn off is rain-water; but constantly a line of wetness may be found on a hill side, where the springs are thrown out, oozing through the field below. Draw your drain deeply along this line, and you will require no furrow drains lower down. Again, I know of my own knowledge that in this southern part of England grass-land may easily be overdrained; that consequently, where drains have been cut too thickly, every other drain has been blocked by the tenant purposely and properly. One field of good land was, I know, so much injured that the grass became of inferior quality, as was proved by its requiring only three days instead of four to make into hay—the effect of impoverishment in the sap of the grass. A most able agriculturist, to whom the fact was stated, could not believe it; but he lived in Cumberland, in sight of the mountains, which enjoy 124 inches of rain for our 24. So true is it here, that on my own meadows I have adopted the plan of damming the streams in summer. The water in the land consequently does not escape from the land, whilst the stream finds its way up the drains, and rises as in a sponge; so that this kind of sub-irrigation keeps the bottom cool and the surface green, while other meadows are scorched by the summer sun. I say, then, that if, avoiding system in draining, you cut out your work to the substance of your land and its slope, draining should hardly ever exceed £3 an acre all round, and should often be done for much less. A previous step, however, is often required:—

§ 2. *The Removal of Useless Fences.*

It is many years since this Journal first showed the evils arising from useless hedges and trees. Mr. Grant,* by actual survey, found that in ten parishes around Exeter, averaging 3000 acres, there were 5680 fields under five acres, and calculates moderately the loss of land at one acre in ten; that is, at one whole of these parishes. In Broadclist alone there were hedges enough to reach from London to Edinburgh; but in that parish they have been greatly reduced, and would now, I suppose, stretch little further than York. Devonshire is famous indeed for its small inclosures. But the next year, Mr. Grigor surveyed four square miles in four districts of Norfolk, and arrived at the same result there, an injury of 10½ per cent. from hedges and trees. With regard to trees, "The utter extinction of the land overshadowed by trees," said his informant, "would be gladly submitted to by every farmer, provided the trees were to be annihilated, and that without any diminution of rent."† By removing these fences and trees, then, in many districts landlords may add one-tenth to the size of their farms, for the injury is not at all overrated, as I know by experience; since though it is now a very long time since my own internal fences have been removed entirely, I still find it useless to plough the land within five yards of a boundary fence full of ash-trees, and in Devonshire the roots of elms meet sometimes in the middle of the field, eating up altogether the food of the turnips. Every farmer knows the other evils produced by hedges. 1. They encourage mildew in wheat for a wide distance within the field—a most serious loss. 2. They harbour weeds, which spread their seeds through their fields; and, 3, birds which devour the corn. They occasion a serious loss of time to the ploughman in turning at the land's end, and make it almost impossible to use the larger implements, such as a drill drawn by five horses. Where hedges too are, there must be gates and gateposts—a serious item in the carpenter's bill. How far, then, can fences be dispensed with? Where Down sheep are kept, which are always within hurdles or in care of a shepherd, they are utterly useless, and Down farmers certainly neither have them nor miss them. The owners of long-woolled sheep, I know, commonly divide their flock into small lots in summer. Their attention I must especially call to a passage in the report upon Gloucestershire:‡—

> On one farm the flock of Cotswold sheep used to be managed, running at large in separate fields, feeding on the young and old seeds. The number of ewes kept for many years varied from 100 to

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* If any one doubt this, let him reckon how many rows of swedes, at a given interval, he can drill along the side of a hill, as compared with a flat.

* Journal, v. 420.

† On fences, by J. Grigor. Journal, vi. 194.

‡ Bravender's Report on Gloucestershire. Journal, xi., 173.

110. The present occupier, seven years since, noticed the folding-off system practised in Wiltshire through the summer on vetches, clover, &c., and tried it a little at first, increasing as he felt the benefits. *His stock is now* 150 *ewes of the same breed, and the increase is owing wholly to the folding-off system.*"

What would be said if a manufacturer produced 100 pieces only of cloth while his neighbour turned out half as many more from the same weight of cotton? Yet so it seems to stand with our flock-masters through a wide breadth of England. Here is no outlay of capital wanted; no newfangled method—nothing but a crowbar and a few hurdles. Our own practice, if recorded, I always believed, and still believe, can do more for us than even the discoveries of science. To return to hedgerows: the expense of their removal has never cost me anything. The tenants have done it, and the fuel has paid the labour: the job of removing a hedge has even been sold to a labourer. But this will be otherwise where wood is plentiful or coals are cheap. The trees removed ought to help for other improvements. Unfortunately, the time has gone by for selling them, and as every one is now aware that they should be cut down, timber in many neighbourhoods is become a mere drug. At any rate, however, they will more than pay for the removal of fences, so that here must be one cheap remedy for country gentlemen. There is another remedy, perfectly costless, on which, as it belongs though not to the science, yet certainly to the practice of farming, I cannot but say a few words:—

§ 3. *The Diminution of Foor-footed Game.*

The rabbit is now admitted to be indefensible. He will clear by the covert side three or four acres of barley, which never comes into straw. He is self-convicted. But the hare will travel two miles out by night for his supper; and yet, though less palpable, the hare's bite is not the less mischievous. Even he will often feed down in winter or spring twenty acres of wheat, which comes to a crop indeed, but is apt to mildew, and is perhaps worse by a quarter the acre. Swedes, too, are gnawed and exposed to frost, so that farmers sometimes store their swedes for protection, not against the weather, but the nightly visitor. I have known farmers give up the growth of winter vetches altogether where hares have been swarming. The amount of loss may be measured in this case by the fact of a farmer's having been obliged, as I know, to send his flock twenty miles off in spring to water-meadows, for the use of which he paid £60, instead of keeping them on vetches which he might otherwise have grown on his hired land at home. It is asked, indeed, sometimes, how many hares eat as much as a sheep? But the question is wrongly put. Sheep do not roam at will, or help themselves from the growing crop. A hog does not eat many potatoes, but who could bear loose swine in a kitchen-garden? A good farmer rated to me the injury on his land from hares at 5s. an acre. The excess, however, is now in course of removal: hares in moderation, pheasants, and partridges do no harm.

We may return to improvements in cultivation.

§ 4. *Burnt Clay.*

If there be any land which requires improvement, it is our real heavy clays; if there be a cheap and effectual mode of improvement for land, it is the burning of clay. The practice has been supported by varied evidence in this Journal: ten different papers have deposed to its efficacy, yet I doubt if it has been steadily adopted by many heavy land farmers where it was unknown before, so we must call the witnesses once more into court. Mr. Baker, of Writtle,* no mean authority, says that it prevails in the Roothings of Essex; that it renders the land for several years more easy to pulverize, improves the first grain-crop 20 to 25 per cent.; that the barley is of a better quality by 2s. a quarter; that it costs 40s. per acre, and that there is no manure so cheap at the price. Mr. Eli Turvill† says, that in the Roothings the first crop pays for it, while the land is much better for the following crops; that it is repeated every four or six years. Mr. Litchfield Tabrum‡ began the practice in the Roothings in 1823, spent on his farm a large annual sum in this manner, yet found it answer, and knows that it improves land by 25 per cent. Leaving Essex, we find Mr. Pierson§ saying that clay-burning is now very extensively practised in Suffolk, and that his Farmers' Club reported strongly in its favour. Mr. Raynbird|| says that the practice of burning the soil dug from the corners of fields is very general in the heavy land of Suffolk. This is called "border-burning." There is another system of ploughing, harrowing, and then burning with the help of thorns or furze, the whole surface of the field. This is called "clod-burning." In Cambridgeshire, and again in Bedfordshire, Mr. Pym¶ practised border-burning for seventeen years on heavy land (which I have myself seen), and in-

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* On the farming of Essex. Journal, v., 13.

† Eli Turvill on Burning Clay. Journal, iv., 267.

‡ Litchfield Tabrum on Burning Clay. Journal, iv., 268. See also Mechi on Burning Clay. vii., 297.

§ Pierson on Burning Land for Manure. Journal, viii., 77.

|| Report on Farming of Suffolk. Journal, viii., 317.

¶ On Burnt Clay as a Manure, by F. Pym.—Journal, iii. 323.

creased his produce of wheat nearly 10 bushels an acre. Another witness, having heard at a Bedfordshire meeting farmers declare "that they could not cultivate to any profit their strongest and worst lands without clay-burning," used it in Leicestershire, where it answered so well that his neighbours adopted it too. He says:—

> "A neighbouring farmer tells me that a field he dressed in this way *seven* years ago has *ploughed easier by a horse draught,* and has been *like different land ever since;* whereas lime, especially if very caustic, makes the land closer and colder than ever."[*]

Yet I know a case where lime has just been vainly applied at a great outlay to an entire strong clay farm taken in hand, and burnt clay has not. So slowly spreads agricultural knowledge. The most striking account, however, is is Mr. Randall's[†] of his poor clay farm in Worcestershire. He tells us of a field called Roughhill, valued at 7s. 6d. an acre. This he clod-burned at a cost of 42s.; and after vetches fed off, got 45 bushels an acre of wheat, which sold, at 7s. 5d. per bushel, for more than the fee-simple of the land; and he gives many more cases which a clay land farmer will do well to read. He tried the ashes as manure against sheep-folding, and found them equal; and I have myself found them so likewise. They not only open the land, but manure[‡] it as well. The cause, no doubt, lies in Dr. Daubeny's distinction between the available and unavailable parts of the soil, and the unavailable parts must be decomposed by the fire. Still the mode of action is uncertain, and chemists would do well to examine it; the result is certain on most soils, and, as farmers, meanwhile we may practise without quite understanding it. Often, however, instead of making heavy land light, we want to make light land heavy, which must be done by marling or claying.

§ 5. *Marling or Claying.*

I need not describe the effect of marling a blowing sand. The finest example I have seen is on the Duke of Bedford's home-farm at Woburn, where in consequence the old parish turbary is waving with corn. The glories of Holkham, too, once a sandy waste, rest on this foundation of clay. The Lincolnshire plan, also, of digging deep trenches in peat, and throwing up the clay on the surface, has been often described; but it will not be amiss to give the following figures by a fen-farmer, because people are scarcely aware how *cheap* are our standard modes of improvement, and how immediate is the return. The cost of thus claying[*] in 1841 was put at 54s. The effect is stated as follows:—

PRODUCE AFTER CLAYING.

Yrs.		£	s.	d.	£	s.	d.
1st.	6 qrs. oats, at 24s.....	7	4	0			
2nd.	Seeds (7 sheep per acre)	2	2	0			
3rd.	30 bshls. wheat, at 60s. per qr..............	10	17	6			
					20	3	6
	PRODUCE OLD STATE.						
1st.	5 qrs. light oats, at 20s.	5	0	0			
2nd.	Seeds (4 sheep per acre)	1	4	0			
3rd.	20 bshls. very light seed wheat, at 50s. per qr...	6	5	0			
					12	9	0
	Profit in three years				£7	14	6

The outlay is 54s., the yearly return 51s., or about 95 per cent. profit. The figures indeed of the produce would now be lower, but *the difference must be the same.* There is a great deal of land in the wide eastern fens which may still be so treated. The mosses of Lancashire are more difficult, being poorer, softer, and deeper, like the Irish bogs; but they, too, are beginning to yield. Mr. Wilson Ffrance has reclaimed 700 acres of this barren waste. The expense has been greater, because the marl has been led upon a railway, but it has paid well,[†] and the potatoes are worth £20 an acre, being exempt from disease on the peat. In another corner of England, Somersetshire,[‡] a different course is pursued; there peat finds a sale as fuel. The peat is sold to purchasers, who pay for it £20 per acre as it stands in the ground, cutting and removing it, as well as levelling the ground afterwards at their own expense. The peat is being dug away to a depth, perhaps, of 15 feet, and the river floods gradually deposit silt on the bottom; a very cheap, or rather, profitable process, certainly, producing excellent land into the bargain, which lets at 40s. an acre. There is yet another mode of improving moory land—

§ 6. *Lime.*

I do not speak of lime as an ordinary manure, in which character it is considered indispensable on the west side of England, and is generally found utterly useless elsewhere. Whether this difference arise from soil or climate, I know not; but I believe lime to answer best in rainy climates on wet soil of primitive strata. In western districts, when land is first brought into use from waste, a heavy dressing of lime is a *sine quâ non,* and hence the discovery of a limestone rock is a public benefit. Lime, too, there has a peculiar effect in sweetening and strengthening grass. As an example is always useful, I may cite again Mr. Blake's improvements on Brendon-hill in Somersetshire, inspected by me many years since, and now described by Mr. Acland.* It is as sour, bleak, and backward a country as can be visited. Mr. Blake, after draining, dressed at once with 100 bushels of lime per acre, and laid the whole down to permanent grass; giving it afterwards 50 bushels of lime every three years, and letting it by auction as summer pasture to low-country graziers. The increased value is as follows:—

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[*] Journal, iii. 324.

[†] Journal v. 113.

[‡] In Somersetshire, a farmer, near Bridgewater, having some patches on his land where the crop always failed, burned the clay, and cured the evil. He has since used burnt clay regularly on his farm.

[*] Journal, ii. 406.

[†] Consult an interesting account of Mr. Ffrance's operations in Mr. Garnett's Report on Lancashire. —Journal, x. 25.

[‡] See Report on Somersetshire in the present Number.

	Acres.	Rent 1802.	Valuation 1832.	Let 1849.
Venne Farm ..	233	£ 100	£ 115	
Out of which..	166	..	..	£365
Cooksley Farm	129	..	45	
Out of which..	95	..	..	176

The improved letting included tithe and taxes, and there is a further deduction of 12s. 6d. to be made for 50 bushels of lime per acre every third year; but the practical success, as I have myself seen, has been long complete. The wisdom of Mr. Blake has consisted in the adaptation of means to his circumstances, and he has given an excellent example for his Welsh neighbours to work by. The profit is certainly very large. In Cheshire we find a very distinct but equally effective mode of improving grass land:—

§ 7. *Boning Pastures.*

This Cheshire practice consists in applying an extraordinary dose of bones to pasture land. "For pasture land, especially the poorer kind," says Mr. Palin,† "there is nothing equal to bone-manure, either as regards the permanency of its effects, or the production of a sweet luxurious herbage, of which all cattle are fond. Many thousand acres of the poor clay soils have been covered with this manure during the last eight or ten years." The average quantity used is about a ton and a-half to the acre; it is therefore a landlord's improvement, on which 7 or 8 per cent. is generally paid. Boiled bones act as long as unboiled bones, retaining the phosphorus, though not so quickly, having lost the animal matter. Boiled bones (1845) cost £3 10s. per ton; the outlay then was 5 guineas per acre, sometimes £7 or £8. "I have known," says a correspondent, "many instances where the annual value of our poorest clay-lands has been increased by an outlay of from £7 to £8 an acre, at least 300 per cent.: or, in other words, that the land has been much cheaper after this outlay at 30s. than in its native state at 10s. per acre; with the satisfaction of seeing a miserable covering of pink-grass, rushes, hen-gorse, and other noxious weeds exchanged for a most luxuriant herbage of wild clover, trefoil, and other succulent grasses." Though much of the clover and trefoil may disappear in five or ten years (sometimes they last fifteen years), an excellent herbage remains. Draining, the writer adds, "*may be carried too far* where bones are used, for boned lands suffer by a dry summer. The land should be kept cool."* I have found the same thing on water-meadows. The freer the grass is growing, the more it suffers from drought; and this is natural, for a larger supply of sap is required. This writer adds, "*I have known many a poor, honest, but half-broken man raised from poverty to comparative independence, and many a sinking family saved from inevitable ruin, by the help of this wonderful manure.*" Indeed, I believe land, after boning, will keep three cows where two fed before. As to this practice, however, caution is necessary. It seems to belong to cold clays for grass in Cheshire, though on such soil it would hardly answer elsewhere, even for turnips. A Cheshire landlord told me that he had tried it vainly for grass in Suffolk. I know no case of its success out of Cheshire, unless in the bordering counties, and have heard some cases of its failure even in those. It will not do, therefore, at all to adopt it hastily. We only know it to have succeeded about Cheshire, which is on the red marls geologically, and on the rainy side of the country, and must remember that it is a costly proceeding, striking in its success, but as yet circumscribed in its practice, and therefore in the proof of its efficacy.

§ 8. *Chalking.*

The process of chalking, on the other hand, is a very wide and a very cheap one, for it costs under £3 per acre, and is as old perhaps as the Heptarchy. I have seen the chalk carried by donkeys over the fields in Dorsetshire; wound up by shafts from small mines, and wheel-barrowed in Hampshire; worked from a quarry and carted on the Lincolnshire hills which overlook the Humber. Yet, on the other side of the Humber, on the Yorkshire wolds, this cheap improvement is neglected by the farmers, though it lies under their feet, and in riding the length of the Southdowns you may see much land that wants it. No one doubts its efficacy if the chalk be of the right kind. I believe, old as is the practice, that residents on southern chalk-hills would find few farms where some field at least, or some rough ground, does not want it, and certainly there is no lack of hands ready to spread it. Sometimes, indeed, you may plough up the chalk if it be soft enough, and so save all hand-work and carriage. I have seen this succeed on the Surrey hills.

(*To be continued.*)

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* Report on Somerset, near the beginning.

† Report on Cheshire, vol. v. p. 89.

* Report on Cheshire, vol. v. p. 94.

STORRINGTON FARMERS' CLUB.

At a recent meeting of this club, held at the White Horse, Storrington, there was the strongest muster we have ever seen, except on the day of the annual meeting.

We noticed, amongst others, Mr. Upperton, Mr. Lear, Mr. Rigden, Mr. Stent (Fittleworth), Mr. Farhall (Petworth), Mr. Chatfield (Greatham), Mr. R. Emery, Mr. Cripps, Mr. Sherwin, Mr. Hardwick, Mr. Mudd, Mr. Stanford, Mr. Battcock, Mr. Griffenhooffe, Mr. Dumbrell, Mr. Brown, Mr. Elliott, Mr. D. Allen, Mr. W. Boxall, Mr. J. Boxall, Messrs. Hares, Mr. Ford, Mr. King, Mr. A. Mitchell, Mr. Suitor, Mr. Challen, Mr. Duke.

Mr. UPPERTON occupied the chair, and opened the business of the meeting by calling on the hon. secretary (Mr. Lear) to read the minutes of the last meeting.

The SECRETARY having complied,

The CHAIRMAN observed, that Mr. Rigden (of Hove) would introduce the subject for discussion.

Mr. RIGDEN rose, and spoke as follows:—Mr. Chairman and Gentlemen, in introducing the subject for discussion, as named in the circular, I can but feel conscious that there are many members more competent than myself for the performance of the task; but as in the discussion, which may probably follow, something of interest and benefit to us all may be heard, I will proceed to offer some few remarks on the first part, viz., the advantages of root culture. That the advantages are great I think is almost universally admitted, and perhaps nothing I can say will further enlighten you on the subject; but when we look about us and consider the enormous expenses of rent, tithe, taxes, and labour, to which we are subject, it is enough to strike us with astonishment. Yet it is paid; and although we are not yet able to compete with success against our continental neighbours, we have been able to make a stand against them; and this fact I consider may, in a great measure, be attributed to the extension of root culture in this country. If you go anywhere on the continent, and see an extensive grower of roots, I will engage to say he is also a large grower of corn; for an extensive growth of the one will be certain to give an increased production of the other (Hear, hear). I will now proceed to what I conceive to be the best and most advantageous method of cultivating the various descriptions; but before I do this, I must observe, that much will depend on the locality in which the cultivator is situated, with regard to the best method of his proceeding, as the soil and climate in the various localities differ materially: I will, therefore, confine myself to my own locality, expressing my conviction at the same time that others who are situated in cold stiff lands cannot profitably farm on a similar system. The first root I shall notice is mangel wurzel—a root which I believe was scarcely known in this country until the commencement of the present century; and when first introduced, so little was its real value known, that those who cultivated it used to feed off the leaves and throw the roots away. First, then, with regard to the preparation of the ground in which you intend to raise your crop of mangel. I always consider it desirable, not only for mangel wurzel, but for all root crops, to apply your manure in the autumn, and plough it in as early as possible; and for mangel, give it two or three times ploughing in the spring. I have never failed in getting a good crop of mangel by adopting the following method:—I get my ground in a high state of cultivation for rye, and after the removal of this crop from the land, manure heavily, and a good crop of mangel has invariably followed. But, as I have before observed, in cold heavy land this cannot be done. The next point is, the best time for sowing the seed. This is an operation which may be effected at too early a stage, inasmuch as the plants would be liable to run to seed; but under this misfortune the early sown is not left entirely without a remedy, since he can sow again. I fancy the best time in the spring is about the 20th of April, or from that to the 5th or 6th of May, when it will seldom or never run to seed. For some years past I have selected, as the most profitable description of mangel to cultivate, the yellow globe. I have grown the long red, but have entirely abandoned it now, for the reason that it contains a considerable deal more water than the yellow globe. In this county the seed is seldom sown in ridges. I always drill in the flat, at a distance of 28 inches between the rows; but in some land the rows may no doubt be advantageously left something further apart. Now with regard to the consumption of mangel, I have heard some persons remark that this root contains no virtue whatever; and I am not altogether surprised that it should be thus undervalued, since it is often given to cattle at a great deal too early a period, when there is indeed but little nutriment to be obtained from it. It is my own practice to commence feeding with it in March, and at that time, and after, I believe, there is scarcely any animal that this root is not well adapted for; and for a flock farm (to which, by-the-bye, my arguments generally are applied) it is an excellent food to follow the Swede turnips, and continue up the time until another green crop can be had. From March to May it is very valuable for ewes and tegs, and useful also for working beasts and cows, although if the latter be fed too liberally with it, notwithstanding it would give a great increase of milk, the quality of that milk will be greatly depreciated, and not nearly so well adapted for the making of butter as milk coming from cows fed upon other food (Hear). The only other point to which I shall allude in connection with this root, is the storing of it after it is drawn from the land; and, seeing that a great quantity of mangel is spoiled in consequence of the inefficient method too frequently adopted for its preservation, it is a question of some importance. In the district in which I reside, we have recently avoided one evil which we formerly practised in storing away, or rather in getting up the crop. It was the practice to allow the roots to remain in the ground until the first week in November, a practice which experience and careful watching have proved to be disadvantageous in every respect; and we now generally commence pulling them about the middle of October, and indeed sometimes earlier than this. In storing them away, I have them piled up in a triangular form, something like the roof of a house, in which are left apertures—a sort of chimney—by means of which the evaporation caused by the sweating or heating of the roots escapes. These piles are then covered over with straw, and in the winter, if hard frosty weather be likely to set in, a little mould is used as a preventive against the frost, and is afterwards removed. I shall now proceed to the turnip, of which there is a variety of sorts. We will first take the swede, but before offering any of my own remarks on its value, I will read to you a few short extracts, taken from an old work (1796) which fell into my possession not long since:—"This country (England) is indebted for the original introduction of the Swede turnip to the Townshend family. Turnips were formerly cultivated only in gardens and other small spots, but in the reign of George I. the then Lord Townshend attended the King to Hanover in the quality of Secretary of State, and observing the advantages of this valuable root, and the fertility it produced, brought the seed and the practice into England, and recommended it strongly to his own tenants. The experiment succeeded, and by degrees it gradually spread over the country." Another extract from the same work shows there was a difference of opinion entertained at that time as to its real value: "The Swede turnip has been sown in small quantities by a few individuals, most of whom approve of it, as it is in perfection a full month later than the other kinds. Others disapprove of it as being dry, hard, and thick-skinned, and consequently, as they supposed, affording little nutriment." I will read a short note, also, by a farmer, from the same: "I find by experience that the Swede turnip is of little value. It is very dry and woolly, with very little feeding quality." I have troubled you with these extracts merely to show how materially the opinion with regard to the value of this root has been changed since its introduction to this country. It is now generally, and I might say universally, acknowledged to be some of the most sound feeding roots that can be produced. For early feeding I should recommend the early Tankard, red and white, sown the beginning of May, followed by the Pomeranian, Scotch Yellow, the White Round, and Green Round. The latter is much the soundest food, especially for winter use. Amongst the various descriptions of swedes, Skirving's Swede was formerly considered the best; but it has in a great measure been superseded for winter feed by hardier sorts. They will answer very well to be used before Christmas, and may, perhaps, be grown to a greater weight than any other description; I have known them in first-rate turnips to reach 20lbs. weight. It is the custom with many farmers to make a fallow, and thus sacrifice their ground in order to secure a good turnip crop; and I think, in many instances, without any occasion whatever. These times will not admit of ground remaining idle and unproductive. A crop of rye or winter barley might generally take the place of the fallow with advantage, followed with turnips. I am, however, aware we must in a great measure be guided by the nature of the soil, &c.; but speaking of farming for turnips in a broad and general sense, the fallowing system is, in my opinion, needless and unprofitable (Hear, hear). For sheep feeding I use the Tankard Yellow Bullock, White Rounds and Green Rounds, and then Swedes in succession; but, generally speaking, sheep require some assistance with turnips to move them on, and more especially on that land that is not in every respect adapted for the cultivation of turnips. I will now go to the white carrot, for the extension of the cultivation of which I believe we are indebted in a great measure to Sir C. M. Burrell, and I have no hesitation in saying that its real value for cattle feeding requires only to be better known to cause it to be still more highly appreciated by agriculturists generally. In preparing the ground for this root, I should recommend in small farming to trench it well; but in more extensive farming the subsoil plough would be better adapted. I have heard it argued that carrots do not require manure, but I totally disagree with this, being satisfied that every root crop requires a liberal supply of manure. There is a great deal of trouble and expense in producing the carrot crop, but still it will be found a profitable one if properly managed. Upon an average it costs about 30s. to 40s. per acre for hoeing, and about the same for getting them up and storing them away. There is no animal that will not do upon carrots: cart-horses will do exceedingly well upon them in equal quantities with oats, say about two bushels each a-week. Milch cows cannot have better food. It is besides a heavy crop, and as many as 1,200 to 1,400 bushels an acre are frequently grown. I prepare the ground for this crop in the same way as for mangel—manure liberally in the autumn and plough it in, and in the spring it will be found in excellent condition, which all crops require. To secure a full crop it is requisite that the ground should contain in it an impetus to send the plants off at once. Give them a good start and they seldom fail. I generally sow them about the 20th of April. There is one more crop to which I will call your attention; for although it cannot perhaps be properly included in the category of root crops, it may be worthy your notice—I mean the cow-cabbage, which is a most excellent food, more especially for ewes and lambs in the spring. There are no bounds to the weight which this crop will reach in highly cultivated ground. I generally sow the seed early in April, in a bed prepared for the purpose—a dung mixen will answer the purpose very well, although I must admit it would be bad economy to practise the plan. The plants are put out up to the latter end of June, and are fit to pull early in November. For a later crop I put the plants out immediately after harvest, between two crops of clover, and in a dry summer nothing is more hard than a crop of this cabbage, in the month of July and about this time. I think, gentlemen, I must now bring my observations to a conclusion. I fear I have not acquitted myself in the manner I could wish; but if any one present can derive any benefit from the remarks I have made, or if it should lead to any questions resulting to your general benefit, I shall be both pleased and satisfied.

Mr. Rigden in taking his seat was loudly cheered.

The Chairman called the attention of the members to the practice of carrying on their discussion in an irregular manner—a practice which he hoped would be discontinued; and he thought the most effectual way of obviating this, would be for every member to rise before he attempted to address them, or otherwise it was impossible to hear one from another (Hear, hear).

Mr. Lear said he had waited what he considered to be a reasonable time, in the hope that some other gentleman would feel disposed to offer some remarks on the various subjects which Mr. Rigden had so ably introduced (Hear). He (Mr. Lear) hardly knew to what he could attribute the silence of the members, unless it was to the fact, that although their experience in the cultivation of roots might lead them to think in some respects differently from Mr. Rigden, they felt somewhat diffident in expressing an opinion contrary to that entertained by so high an authority. He, however, (and he was sure Mr. Rigden felt the same wish) was desirous that every member should express his own opinion, which he had acquired from his own experience and practice. He knew he might be termed nothing more than an apron-string farmer (laughter), still he farmed on a fast principle, and he certainly felt delighted to find his opinion on fallowing, which he expressed a short time since at Petworth, backed by so high an authority as that of Mr. Rigden. I have sown rye after wheat, without manure, and commenced cutting in April, and after clearing it off sowed with mangle, and succeeded in getting a good crop. He was certainly much surprised to hear the time at which Mr. Rigden was in the habit of sowing for mangle. He (Mr. Lear) should be afraid it would run to seed. Nothing had been said by Mr. Rigden as regards steeping the seed. He (Mr. Lear) was favourable to that practice, and he recollected a circumstance which occurred to him that appeared to confirm the opinion he has expressed on that head. He once steeped his seed for 24 hours, as an experiment, and when it was sowed his men came to him and said they had not quite enough seed, and wished to know whether they should wait to steep more seed, or finish at once with dry. He directed the latter course; and he could assure them the difference in the growth of the plants from the steeped and unsteeped seed was more than he could have imagined, and appeared to him a convincing proof of the advantages of steeping. He always drilled his seed on the flat, a yard apart, as a fallow crop between crops of corn. The disadvantage of mangel was that it would spoil the milk and butter when given liberally to milch cows; and the farmers generally were too fond of over-stuffing their cattle with roots, which puffed them up with wind until they were surfeited (laughter). Believing that mangel could not bear the damp, and that it also required air, he made a practice of stowing it away at the end of his oast-house, and in frosty weather covered it with straw, which he removed after the frost had broken. With regard to the turnip crop, he must admit he could not go into the different varieties, being only in the small way; but he could say that even this year, which had been unusually bad in his locality—a fact which plainly manifested itself at the present time by the ugly formed bulbs—he had grown a good crop of swedes after trifolium, tares, and winter barley, with once ploughing. When he manured his ground, he generally put on about 20 two-horse cart-loads to the acre. He quite coincided with the views of Mr. Rigden with regard to the cultivation of the white carrot crop, and the expense attending it; but he was inclined to think they were sometimes over-rated with regard to their quality. His team consisted of one horse only (laughter), and he always had carrots and hay; and notwithstanding what he had said respecting the overvaluing of their quality, he had no doubt but that if farmers were to give a few more of them to their horses, they would look much better than they did (laughter). He thought he had grown 1,200 bushels to the acre, but he had never had them accurately measured (Hear, hear, and a laugh). Mr. Rigden had spoken of the cabbage, and he (Mr. Lear) would like to know if that gentleman alluded to the drum-head.

Mr. Rigden.—Yes, I did.

Mr. Lear.—Because he had grown the Jersey cow-cabbages, although he thought he preferred the drum-head, which was a heavier crop; but it was astonishing the amount of food that could be got from the Jersey cabbage, which would bear plucking and plucking until there was no end to plucking. It might be said, that by this system the ground would be greatly exhausted, and he had no doubt of the fact, for when the stalks were pulled up they resembled hedge-stakes more than anything else (much laughter). But why should not the ground be exhausted, and its fertility restored by manure, to be again exhausted (cheers)?

The Chairman then called on

Mr. Boxall, who said he had but a very little to add to the remarks which had been made; but he would observe, that when he first cultivated mangel he adopted the ridge system in drilling the seed, and he learned from after-experience that in sowing on the flat system the fly were much less destructive, by the difference, he should think, of ten times (Hear). He had grown 53 tons weight of mangel to the acre, manured with 20 bushels of wood ashes, with a quantity of salt, hoed in during the summer. Salt was a very great favourite of mangel, and to satisfy gentlemen that there was little fear of over-dosing with it, he would relate an instance which occurred on his own farm. He had two pupils at the time, and they were anxious to ascertain what quantity of salt this root would bear; and they accordingly, without his knowledge, placed a great quantity of it close to and even on the crown of several plants, and although it somewhat checked the growth of the leaves, the roots continued to swell out until they reached quite an average size (Hear). With regard to turnips, he had always remarked that the closer the seedsman followed the plough the better. He could easily account for the seed germinating quicker when sown immediately after the ground was moved, but he could not quite satisfy himself with regard to its rapid progress in its after-stages. He wished to ask Mr. Rigden whether he found that milk from cows fed on mangel required a longer time to convert it into butter than milk from cows otherwise fed.

Mr. Rigden.—I seldom make butter, and always consider it a very bad sign when I see the churn at work on my premises. Mr. Dumbrell, perhaps, could answer the question.

Mr. Dumbrell said he had never experienced any difficulty whatever. He agreed generally with Mr. Rigden's remarks, but differed with him respecting the white carrot. A friend of his once analyzed the white carrot, the swede, and the parsnip; and he found the first to contain one-third water, the swede a very little water, and the parsnip none at all. The red Altringham carrot was much sounder food, and nearly as heavy a crop as the white; but nothing made better butter than mangel, if kept till March before it was used.

Mr. Sherwin expressed his opinion that a little cake with the mangel would improve the butter (Hear, hear). He wished to ask Mr. Dumbrell respecting the cultivation of the parsnip, and whether he considered it a profitable crop. It was beginning to be an important crop for the cottager, now that potatoes had partially failed.

Mr. Dumbrell said the expense of getting them up was too great.

Mr. Lear observed, that as the Chairman had taken the liberty of calling on gentlemen to speak, he should take the liberty of calling on him to deliver himself of his ideas (laughter, and Hear, hear).

Mr. Upperton said he had no particular objection to state the result of his experience as far as it went, although it was in some respects adverse to that of Mr. Rigden and Mr. Boxall. It was his custom always to sow his mangel in ridges, and was generally successful. He thought that in stacking the mangel away, care ought to be taken not to interfere in any way with the roots, or they would be sure to rot. It was frequently done in tearing off the leaves. Thinking that mangel when stacked required as much air as possible, he once directed that a pole should be put up through the centre of the heaps; and when they were taken out all the roots around the pole were found frozen. Since that time he had followed his old plan, which was merely to cover them up with oat or barley straw.

Mr. **R. Hare**, on being requested, gave an explanation of the system adopted by (as we understood) Mr. Drewett, of Guildford, in cultivating and stacking mangel. His system was, to plough up a wheatarsh very deep immediately after harvest, and manure with about eight or ten loads of good hog-dung, made from pigs fatted on corn. The manure was ploughed in, and the ground sometimes subsoiled. The seed was drilled in rows 3ft. 6in. apart; and, when the plants were hoed, from 3 to 5 cwt. of salt, with 2 cwt. of saltpetre, to the acre, applied.

Mr. **Griffenhoofe** spoke favourably of mangel wurzel. He sowed the seed in ridges, with about 20 loads of manure per acre, and 10lbs. of seed; set the plants as early as possible; and, when taken up, stacked them away, without trimming them, and covered with straw and a little mould, to preserve them from frost. There was no better food for ewes and lambs,

Mr. **Stent** said, he thought Mr. Rigden and Mr. Lear had given him and his Petworth friends a pretty good rub about their fallowing for turnips. Those gentlemen, however, must recollect that at Petworth and its neighbourhood they grew a great deal of couch; and whilst that was the case, they could not grow turnips without a fallow.

Mr. **Rigden.**—But you should not grow couch (much laughter).

Mr. **Stent.**—But we can't help ourselves, and should be pleased to find the means to thoroughly eradicate it (laughter). Mr. Stent then alluded to mangel wurzel, which he considered most excellent food for pigs, which, when fed wholly upon it, would require but little topping up for the market. He should take this opportunity of reminding Mr. Lear, that on a former occasion he (Mr. Lear) found fault with him for giving his cattle too many roots. In consequence of this advice, or opinion rather, of his friend, he directed his men to reduce the quantity one-half; but the men complained that the cattle could not do their work, and he was compelled to go back to the original quantity (laughter).

Mr. **Chatfield** had grown mangel occasionally, and agreed with Mr. Rigden's system of cultivation entirely; and with regard to turnips, should like to ask the question as to what was the cause of what was termed " fingers and toes"?

Mr. **Elliott** (Petworth) attributed the disease complained of to bad selection of seed, and then entered at some length into the qualities of seeds generally.

Mr. **Rigden** said, if there were any other gentlemen who wished to offer any further remarks, he would wait before replying to a few questions put to him. First, with regard to steeping the seed for mangel, as spoken of by Mr. Lear, he (Mr. Rigden) did not adopt that system, but was always particularly careful in selecting the time for sowing it; and if that were attended to, he thought there was no necessity for steeping the seed, and he was of opinion that if steeped, and dry weather should set in, it would not germinate so readily as when put in dry. Mr. Lear had also alluded to the Jersey cow-cabbage, and all he (Mr. Rigden) could say to it was, that he once sowed it, and found it exactly like rape—nothing better (a laugh). Next came Mr. Dumbrell's observation on the white and red carrot, and he was of the same opinion as that gentleman with regard to the superior quality of the red over the white, but the latter had an advantage in weight of crop of 25 per cent. He agreed with Mr. Dumbrell in his opinion on the cultivation of parsnips, that the expense of getting them up was too great. Mr. Upperton had made an observation with regard to storing away mangel, viz., that he found those roots close round the pole frozen, whilst the others were safe; but if Mr. Upperton had caused the pole to have been pulled out earlier, he believed the roots would not have rotted. In answer to Mr. Stent, on the subject of fallowing, he could only repeat what he had before stated, viz., that he knew what could be effected on some description of land could not be done on others; still, he was decidedly of opinion that the system of fallowing for turnips was adopted much more than was necessary. He had one more subject to allude to, which was the question put by Mr. Chatfield, inquiring the cause of the disease in turnips, called " fingers and toes." He (Mr. Rigden) believed that it was often occasioned from the want of a more careful selection of seed. He should advise all turnip and mangel growers to be particular on that point. Let them go to a respectable seedsman, in whom they could place confidence, for their seed, and he believed they would thus find the best remedy for the disease complained of.

Mr. Rigden, on seating himself, was loudly cheered, and a vote of thanks was passed for the very able and interesting manner in which he had brought the subject before them for discussion.

The **Chairman** then announced that their annual meeting would take place on Tuesday, Feb. 11th, at two o'clock, when Mr. Emery, of Hurston-place, would introduce the subject, which would be on " Draining."

THE LONDON FARMERS' CLUB.

"HOW FAR TAXATION ENTERS INTO THE COST OF AGRICULTURAL PRODUCE."

The usual monthly meeting of the club took place at the club rooms, Blackfriars, on Monday, February 3rd, Question for discussion—"How far Taxation enters into the Cost of Agricultural Produce." The chair was taken by Mr. Thomas. After a few observations from the Chairman

Mr. Cheetham said—Gentlemen: It is scarcely necessary for me to repeat what our excellent Chairman has just intimated to you, namely, that the subject for this evening's discussion is "How far taxation enters into the cost of agricultural produce;" and however judiciously the Committee of this Club have acted in the selection of it, I fear they have not done wisely in confiding its introduction to me, because I see around me many gentlemen, most or all of whom are more competent to discharge that duty than myself. As our state burthens form one of the most important features in our political and social economy, so, from their intricate character, they are most imperfectly understood by a large majority of tax-payers; and on this account it is that I have, under a conviction of my own incompetency, consented to introduce this subject to your notice, in the hope that although I may fail in the principal object I have in view, it may lead the public to a calm and deliberate consideration, and more just appreciation, of this momentous question (Hear, hear). And if the present discussion should excite such a spirit of inquiry as to lead our agricultural brethren to a knowledge of their true position in reference to taxation, one of my chief objects will have been attained (Hear). Without entering into the politics of this question, I do hope that I may be permitted to state that I am unacquainted with the motives which actuated the Committee in selecting the subject for this evening's discussion, but I freely confess that my own leading object in proposing it to the Committee was to enable persons to judge of the difference in the pressure of taxation borne by the British and by the foreign producer (Hear, hear). In the few brief observations I shall feel it my duty to offer, I do not expect to do more than to lead the inquiry so that it may elicit from those around me such practical information as may prove of great utility to those less acquainted with such matters, and reflect credit upon this Club generally; and in prosecuting the undertaking I shall endeavour to be as clear and concise as possible, treating the matter generally rather than in detail, as far as is consistent with the object sought, namely, to ascertain how far taxation enters into the cost of agricultural produce. In order to enable me to carry out my design more satisfactorily, to myself at least, I have selected for my guide the work of a gentleman whom I consider high authority on questions of taxation; and I feel no reluctance in declaring that I not only quote largely from his pages, but that they also form the foundation of the superstructure I am emulous to raise. I allude to Mr. Saunders, of Hemel Hempstead (Hear). Before proceeding further, I may remark, that revenue derived from customs and excise has the inevitable effect of enhancing the cost of food, and consequently the rate of wages; and that such enhanced cost of food again reacts on the productive cost of the food itself, since the taxation of the customs and excise becomes embodied in the necessaries of life consumed by the agricultural labourer, and that the price of exciseable articles is raised above the amount levied upon them. I will endeavour to exemplify my meaning by a familiar example or two; but it unfortunately happens that repealed excise laws are such unusual occurrences in this country, that but few examples present themselves for our consideration; the article of salt will, however, furnish me with all I require upon this point. I apprehend it is well known to most gentlemen present, that during the French revolutionary war a duty of 30s. per cwt. was levied upon salt, which was regularly sold in the midland counties at 40s. per cwt. When the duty was repealed, it was expected that the future price would have been 10s. per cwt.; but it immediately fell to 3s. 6d., and may now be bought in quantities at 1s. 9d. If all our state imposts were swept away, it is impossible to say what might be its price, because its chief productive cost is labour; and it will be my endeavour during this discussion to show that labour is most heavily taxed, and that taxation so acts and re-acts upon itself, as has been said, that it appears a hopeless effort to attempt to arrive at what is popularly termed the "natural cost" of any article (Hear). I have said that taxation acts and re-acts upon itself, and that it does so in an almost ceaseless succession is beyond dispute. And here I may mention that most grievous, dishonest, and impolitic of all our public burthens, the malt tax, as an illustration of this principle, and to show how greatly that tax and its consequences enter into the cost of agricultural produce (cheers). The prize essay of the Anti-Malt-tax Association, at pages 12 and 13, to which I beg to refer gentlemen, shows that, estimating the price of barley at 32s. per qr., the tax and profits compel the consumer to pay for his beer 120½ per cent. upon the original cost of the barley; but, according to the same mode of calculating, and estimating the price of barley to be 25s., which is I believe above rather than below the present rate, the consumer is obliged to pay 148 and a fraction per cent. upon the first cost of the raw material (Hear, hear). Thus it becomes evident, that the portion consumed in the rural districts by the agricultural labourers, handicraftsmen, &c., is through their agency in the performance of another cycle again embodied in the cost of agricultural produce. (Hear.) Such then are a few of the results of taxation as at present levied; and it would be irrelevant to the present inquiry to endeavour to point out a preferable system of raising a revenue. Apologising for these digressions, if digressions they be, I now proceed to the more immediate business of the evening. The word "taxation" admits of a very wide and extensive application; so wide indeed that it embraces within its range all local as well as fiscal imposts. Such being the case, I propose to include all in the present consideration of the subject, and for this reason—that local burdens are clearly state imposts, although levied for local purposes. First, I assume that labour is essentially the raw material in the productive cost of corn; wages are a large source of British taxation, and the cost of bread is the first element of wages. This granted, it remains for me to show the amount abstracted by taxation from the wages of the labourer, and its relative bearing upon the cost of agricultural produce. (Hear, hear.) To elucidate this, let me draw your attention to the average price of wheat for five years, ending 1792, which was about 48s. per quarter, while the rate of agricultural wages was (and had been for half a century) 1s. per day, cottage rents 1s. per week, and national taxation about £18,000,000. In 1795 wages were raised to 1s. 2d. per day, and in 1796, on account of the high price of wheat, to 1s. 6d. and 2s. From 1833 to 1836 the price of wheat only averaged about 41s. Yet, national taxation having risen to 46 millions, wages never fell below 1s. 6d. per day. Again, from 1842 to 1846 the price of wheat averaged about 47s. the quarter, and taxation about 50 millions, whilst wages were still 1s. 6d. An advance of 6d. per day on four millions of labourers, gives 32 millions sterling, which is equal to the whole amount of the increased taxation since 1792, when wages were 1s. per day. In 1790 the wages of carpenters at Greenwich Hospital were 2s. 6d. per day, wheat 48s. per quarter, and national taxation 18 millions. In 1848 wages were 4s. a day, wheat 50s., and taxation 50 millions. From the consideration of the above facts I think we are fully justified in concluding that taxation has enhanced the price of labour full 33 per cent., and that the labourer now receives such 33 per cent. higher wages than he would do if no such taxation existed (Hear, hear). I now propose so to apply the foregoing remarks that I may exemplify the manner in which taxation enters into the cost of agricultural produce; and, to do this effectually, I will give you an estimate of the cost of cultivating an acre of land, dividing the expenses into two elements, as follows:

	Cost per Acre.				Taxation per Acre.		
	£	s.	d.		£	s.	d.
1. Great tithes	0	5	0	....	0	0	0
2. Small tithes, 1s. 6d.; poor, county, highway, and church-rates, 4s. 9d.	0	6	3	....	0	2	1
3. Labourers' wages	1	5	0	....	0	8	4
4. Tradesmen's bills, artificial manure, or food, &c.	0	4	0	....	0	1	4
5. Maintenance of 3½ horses on every 100 acres, at 9s. each per week	0	18	9	....	0	6	3
6. Maintenance of farmer's family, and general superintendence	0	13	0	....	0	4	4
7. Seed corn	£0	9	0	....	£0	3	0
8. Casualties of cattle	0	1	0	....	0	0	4
9. Interest of capital, at £7 per acre	0	7	0	....	0	0	0
10. Rent	1	0	0	....	0	0	0
	£5	9	0	....	£1	5	8

Thus, the expense of cultivating an acre of land amounts to £5 9s., whilst the rent-charges of tithes, poor-rates, &c., being 11s. 3d. per acre, and the direct and indirect taxation 25s. 8d. per acre, the combined amount is 36s. 11d. per acre, or 33 per cent. on the total cost. My next estimate will exhibit more in detail how taxation abstracts 33½ per cent. from the wages of the labourer:

Amount of Taxation on the Expenditure of an Agricultural Labourer earning 10s. per week, assuming such Taxation to be 33½ per cent.:—

	s.	d.			s.	d.
Bread (5 people consuming 7½ loaves) is	3	9	Taxation, 33 per cent., is		1	3
Groceries	2	0	—	—	0	8
Rent	1	6	Dead weight		0	6
Fuel and beer	1	0	—	—	0	4
Meat	1	0	—	—	0	4
Clothes, &c.	0	9	—	—	0	3
	10	0			3	4

Intrinsic or natural labour value is 66½ per cent.; artificial or taxation value is 33½ per cent. In the prize essay of the National Confederation, the amount of taxation on a labouring man's wages, earning 20s. a week, is assumed to be £33 15s. per cent.; in which calculation they have omitted the dead weight taxation on rent at 3s. a week, which would add 1s. a week to the taxation, making it altogether 38 per cent. Having thus shown that taxation amounting to 37s. is paid by the British farmer on every acre of arable land he cultivates, I leave the matter in your hands to apply the amount to the different products which fill up the cycle in a rotation of crops; and I adopt this course with the more confidence, because were I to attempt to apportion the amount it might lead to a great diversity of opinion, and an almost endless discussion upon a portion of the subject which is wholly unimportant. Before I take leave of the subject, perhaps you will permit me to say that as there is much difficulty in adapting an estimate of the expense of cultivation to all soils, the only alternative is to take an average. This has been attempted—with what success I leave others to determine. In conclusion, I beg to thank you for the patience you have displayed on this occasion, and to claim your indulgent consideration of the question I have had the honour of submitting to you. I am fully aware of the imperfect manner in which I have brought this subject forward and placed it before you; but I trust that I shall have your indulgence, and, as I said before, I only expect to succeed so far as to draw forth the opinions of others very much more competent than myself to handle this most difficult question. In throwing these few observations together, I have consulted a work which I consider of paramount importance, written by a gentleman who is well versed in the subject of taxation—Mr. Sanders, of Hemel Hempstead. I endeavoured this morning to get a copy of his work for presentation to the club, but I find that it is out of print.

Mr. W. **Baker**, of Writtle, said: Gentlemen, I have but little to offer on this subject, which has been so fully embraced by the observations of Mr. Cheetham—observations in which I perfectly accord, and in which I am quite sure all those gentlemen who have studied the question will also concur. There are, however, a few points to which he has not adverted; and, accepting what he has advanced as to the principle, and proceeding upon that principle as a correct one, in reference to this question, what I have to say will be said rather in addition to than in corroboration of what has fallen from him. That there are taxes, direct and indirect, pressing upon land is clear; but there is one tax which more especially increases in pressure as the value of produce is diminished in amount—I allude to the tax which is raised in this kingdom under the denomination of poor-rates. This is evident to every one. It became more apparent to me on a recent occasion. At our last harvest meeting, our labourers entered into a convivial song in condemnation of the new poor law. It then struck me that they could never have estimated the value of that law to themselves. I pointed out the great benefit that it was to them; that through this the poor always had the first claim upon the land, and that the landlord must go without his rent, and the clergyman without his tithe, rather than the poor be left without means of support (Hear, hear). I am quite sure that I succeeded in convincing them, and I hope now to convince you—that the poor being a permanent charge upon the land, just in proportion as the value of produce decreases does the amount of that charge increase. I know some persons will argue, that as the poor-rates were formerly three or four shillings in a particular parish, and as they are no more now, therefore no increase has taken place under that head of expense. But if they measure, as they ought to do, all these payments in bushels of wheat, they will find the poor rates to be very materially increased; and not merely the poor-rates, but all other rates which are chargeable on the land, including one which is more oppressive than all others at this moment, as against the tenant farmer—I mean that which goes under the denomination of the tithe rent-charge. Not only is the tithe rent-charge about the same in amount now that it was when wheat was at 56s. a quarter, though the price of wheat is from 38s. to 40s., but it is likely to continue at that amount for some years to come. Consequently, however much wisdom may have been shown by the legislature in basing the tithe rent-charge on the average of seven years preceding the time when it came into operation, it is most injurious to the present occupiers of land. However much it may benefit any future occupiers, it is now oppressive in the highest degree (Hear, hear). Therefore we have two elements of taxation, which enter into the cost of production, increased to a considerable extent, the increase being, in my opinion, from 30 to 35 per cent. Mr. Cheetham treated this question on the broad principle. I have rather been endeavouring of late, in public meetings, to impress the mind of the public by more detailed statements than any which have been made this evening. At the Saffron Walden meeting, I entered into calculations with regard to the taxes which press upon agriculture, and I will give you the different heads as they struck me with regard to the cost of cultivating a single acre of land. First, there is the poor-rate, which I assume to be 4s. per acre, the highway rate 9d., the church rate 3d. Then we have the land tax, which, in the parish in which I reside, is 10½d. per acre, or 10½d. in the pound. The landlord's property tax amounts to about 9d. The assessed taxes I say nothing about, because I believe that where no window tax is paid we may farm without paying assessed taxes.

The **Chairman**: Only in the case of small farms (Hear, hear).

Mr. **Baker**: At all events, as they are in some degree personal taxes I omitted them. Then we have the tax on labour, which, as Mr. Cheetham observed, acts and reacts on the cost of production; and if you assume 10 per cent. as the amount which the labourer pays on the earnings he receives, that would be, in the case of 5 men to 100 acres, 4s. 6d. for each acre. The tax on the tenant we may assume to be the same, for the tenant ought to receive as much for the investment of his capital and for his management and skill as he pays to the labourer, according to the extent of cultivation. However, I have taken it at only about half that sum, at 2s. 6d. Then there is another tax which operates most strongly in relation both to the labourer and the farmer, namely the malt tax (Hear, hear). If there be a tax which is obnoxious in every point of view, it is the malt tax. It is well known that at the present moment, that tax exceeds in amount the price of the article on which it is imposed. By the various manipulations through which the article passes before it reaches the consumer, the price is actually doubled. Yet beer is indispensable to the cultivation of the land. The farmers of the district in which I live give their labourers from three to four bushels of malt for harvest, besides giving them beer throughout the rest of the year; and, assuming that each man consumes four bushels of malt, and that he pays 12s. 6d. duty, the proportion of that duty to each acre will be 1s.; and this in addition to the other charges on that acre, which press upon the occupant! The malt and hop duty both come under the same head; and trifling as the hop duty may appear, it is important in carrying out the details of this question. Putting all these items together, I find that the whole of them amount to a charge of 19s. 3d. upon each acre of land. But it must be recollected that ordinarily land produces corn only one year out of two; that the clover and fallow crops are ameliorating crops, which prepare for the production of grain; consequently, assuming that the land would grow four quarters of wheat per acre—and it must be good land to do so—and five quarters of barley, there would be nine quarters in four years' cultivation. Multiplying the tax by 4, you will find that it produces a sum nearly equivalent to £4 per acre, less than 9d. for each acre; dividing that by the 9 quarters, you find in four years a tax of 77s., and the five quarters of barley and the four of wheat each pay 8s. 7d. per quarter as a direct tax. This is 1s. 7½d. per bushel. You now see the reason why we are unable to compete with the foreigner, who has no such tax to meet. If we can show that we have direct taxation, local and general, entering into the production of corn, to the extent of upwards of 1s. per bushel, I ask is it consistent that the government opening the ports of this country to competition in foreign corn, should not give producers protection to the amount which enters into the cost of production (Hear, hear)? We ask no more; but having shown that all this charge does enter into the cost of production, we claim protection as a matter of justice; and I am quite satisfied that when the public are acquainted with the facts of the case they will take a very different view of this question from that which a great many have taken up to this time. Let me touch for a moment on the bearing which this question has upon the claims of the public creditor. We are told by the *Times* and other newspapers, that public faith is the great thing to be upheld. I maintain that there is another thing to be upheld, and that is public justice (cheers). Unless public justice be upheld, what confidence can exist with regard to any of the institutions of society (Hear, hear)? Progressive taxation has gone on to such an extent that it has entered into the production of every article; and it acts and re-acts until it becomes enormous in amount. Whatever may be said as to the prices of corn under the old system should be received with suspicion; because if we investigate the question we shall find that when wheat was 80s. a quarter, it actually represented only two-thirds of that sum, because at that time it took three £1 notes to purchase two guineas —a difference of about 33 per cent. At that time a very large amount of the national debt was invested, and, with respect to a considerable proportion of it, we know that considerably under £50 was paid for every £100 Consols. You will find that £51 being invested in Consols, with wheat at 80s., 102 bushels of wheat were required to produce that sum. At the present moment the amount that was then invested with wheat at 80s. a quarter has risen to £97, and it would take 388 bushels of wheat to redeem it. There is a glaring inconsistency apparent, not only upon the face of the investment, but in the sum paid by way of interest on the investment; and this is called maintaining the public faith, 388 bushels being demanded to pay off 102! It is, in my opinion, one of the greatest and most astounding grievances that ever oppressed the industrious population of any country. There is a saying in Scripture— "With what measure ye mete it shall be measured to you again;" but here we are required to pay back a debt at 288 per cent. above what we received. With all the expenses of our central government, and with the concurrent expenses of local taxation, we are called upon to compete with the foreigner who has no such taxation to defray, and who not only introduces his raw material, but also the manufactured article, so that flour is imported to supplant the British miller, and to prevent him from manufacturing flour for consumption in this country (Hear, hear). I find that I have already trespassed too long upon your attention (No, no), and I will now leave the discussion in abler hands.

Mr. Bell said; I have listened with very deep interest to the observations of Mr. Cheetham and Mr. Baker, and in the spirit of much which has fallen from them I cordially concur. Honouring as I do Mr. Saunders, I venture to think that he has understated the amount of taxation to which the British farmer is subject. Mr. Cheetham mentioned natural price, and he afterwards spoke of taxation price. It is, in my opinion, very difficult to determine what natural price is, or whether, in fact, there be such a thing as natural price. Natural price must, in a country like England, depend very much on influences like those mentioned by Mr. Baker. For example, the natural price of wheat in England must depend very much on the poor-law, as compared with corresponding provisions in other countries, or with the state of society in countries where no such provision exists. There is a natural price, we say, for corn in England, and there is a natural price for corn in Russia; but the term "natural price" has not the same meaning in reference to the two countries. Mr. Saunders speaks of 1s. a day as the natural price of labour in England in 1792. I demur to that conclusion altogether. I say that the English labourer in 1792, receiving as he did 1s. a day, was underpaid; because the price of labour does not seem to have been at all higher in 1792 than it was a century earlier. I have in my possession some pamphlets written about the year 1690, in which £16 a year is laid down as the wages paid to labourers at that period, besides cottages being given them to live in. That will give about 6s. a week, the sum which Mr. Saunders sets down as the natural price of labour in this country in 1792. Now at the time when the English labourer received £16 a year, or 6s. a week, a cottage free, and (for such was then the custom) a certain portion of land, the taxes paid by the country at large did not amount to more than £2,000,000 a year; and the taxes having risen between the close of the 17th century and the year 1792 from £2,000,000 to £16,000,000, I cannot concede to Mr. Saunders that 7s. a week was at the latter period the natural price of labour. The wages of labour ought to have risen. Mr. Saunders goes on to state that while in 1792 wheat was 48s. a qr., and wages 1s. a day, at the present time wheat is 40s., and wages 1s. 6d. I apprehend that Mr. Saunders is to some extent misled upon the subject. The fact is that during the war prices generally rose throughout England 100 per cent., the wages of labour rising from 7s. to 12s., 14s., and 15s. a week, or about 100 per cent. But the price of wheat rose in a corresponding proportion; it rose from 48s. per qr. to more than 80s., the average price during the last five years of the war being 100s. Since the close of the war wheat has gone down, as many of you know to your cost, 50 per cent., and labourers' wages have gone down not quite to the same extent perhaps, but very nearly; they have gone down from 15s. a week, the average amount paid at the close of the war, to, I fear, something like 7s. or 8s. a week, taking the whole of England.

Mr. Payne.—8s. or 9s.

Mr. Bell.—Now I would say, with all respect for Mr. Baker, that I fear it is not by entering into minute calculations as to the amount of one tax or another that we can come at the truth, or ascertain to what extent taxation presses on the agricultural interest. I would further say, let not this question be confined to agriculturists, but let us embrace in the discussion producers of all classes, because taxation presses quite as much on other producers as on agriculturists.

Mr. Cheetham.—No, no!

Mr. Bell.—At all events you must recollect that if you are now suffering from free trade and our new monetary laws, manufacturers suffered at an earlier period to a fearful extent. How are we to ascertain how far taxation enters into the cost of agricultural produce? Did you ever enjoy the benefit of a system under which taxes of all kinds could be added to cost? If so, then you have only to ascertain the difference between the price which that system yielded, and the prices which you now receive, and the difference will give you the pressure of taxation upon you. Now, how are you to measure the pressure of taxation? How can you measure it but by an instrument adapted to that purpose, and what instrument can that be but taxation money? If you cannot, as producers, add the taxes you pay to the prices you obtain, the taxes which are called taxes on consumption cease to be taxes on consumption, and become taxes on production (Hear, hear). Mr. Baker called your attention to the fact that a certain section of the creditor classes in this country lent to the community at the rate of 102—it does not matter whether they did it in bushels of wheat or in pounds— and are receiving back at the rate of 388. That statement is true, so far as the public creditors of this country are concerned.

Mr. Mechi: No, no.

Mr. Bell: Pardon me; Mr. Baker correctly stated that the public creditor lent at the rate of 102, and is receiving back from the farmer at the rate of 388. The case is the same so far as the private creditor is concerned, with this difference, that in the case of the private creditor there has been no increase of the nominal amount of his claim. A man who 40 years ago lent £10,000 on mortgage, can still claim only £10,000. In the case of the fundholder, we have not only added to the value of each pound we received, but have increased the principal by the difference between 50 and 96 or 97. We have made every pound upon which interest is paid worth twice as much as it was before. Dispute as we may with respect to the effect of Sir Robert Peel's money laws, and of his free-trade schemes, I am convinced that the commercial classes of this country will never gain by that free trade of which they are so much enamoured. The creditor class alone will derive the benefit. It is not the man who manufactures at Manchester that will receive advantage. The manufacturers suffered in 1819 and 1820, before distress fell upon the agriculturists, by being compelled to compete with foreigners at a disadvantage; and I repeat my conviction that they are at the present moment deriving no benefit from that system of free trade which they contributed to establish. When you had the benefit of taxation, money prices in this country rose universally. The price of wheat in 1792 was 48s.; the average price during the last five years of the war was 100s. I have heard it stated, and stated by gentlemen connected with land, that 100s. was too high. I must take the liberty of declaring my belief that those gentlemen are entirely in error. Prices rose during the war in proportion to the pressure of taxation; they never rose higher than that pressure warranted. It was not the farmer alone who gained. Every trader, manufacturer, and commercialist profited by high prices. The manufacturer's prices rose quite in proportion to the farmer's: no favour was shown to agriculturists as a class. The taxes rose during the war from £16,000,000 a-year to £70,000,000. You received high prices during the war because you were highly taxed. But are you not highly taxed now? Do not the burdens of the war remain—(Hear, hear)—and are you not entitled to prices which will enable you to sustain those burdens? (Hear, hear.) If you did not receive more than you were entitled to receive during the war—and on that point I am willing to meet any free-trader or board of free-traders in Great Britain—then I contend that the difference between 40s. and 80s. measures the extent of taxation which you ought to recover in prices. The question admits of very easy arithmetical solution. If a taxation amounting to £16,000,000 justified producers in receiving 48s. a qr. before the French revolutionary war, the question remains, Who pays the difference between the £16,000,000 levied then, and the £56,000,000 or more which is received now? Somebody must pay the difference. Is it the producing classes? The taxes paid are, as Mr. Cheetham stated, chiefly indirect. The whole theory of taxation assumes that they are levied from consumers; and if they are not so levied, they are, as I before observed, taxes on production. The average price of wheat in 1792 was 48s.; it is now 40s., while the taxation has, in round numbers, increased from £16,000,000 to £60,000,000. Supposing the producing classes in this country to be entitled to recover the indirect taxes which they pay, it is clear that they can only do so by adding to prices. But your prices are lower now than when the taxes amounted to only £16,000,000; and you ought to be able to add £40,000,000, if you pay that amount extra. Now, does £40,000,000, startling as that amount is, represent your loss? Not exactly, because you pay £40,000,000 which other parties ought to pay: the difference is, in reality, £80,000,000. I fear that it is only by looking at broad principles, and dealing with great results, that we can approximate to the actual condition of the producing classes in this country. I do not confine myself to the term "agricultural class," because I think all classes are equally interested. We do not stand here, I hope, to oppose ourselves to manufacturers, or to any of the consumers and distributors of wealth. It will, I believe, be found, on examination, that all are interested in the condition of the cultivators of the soil. That condition is, I think, a very fearful one. I am glad that, in an association like this, attention is directed to a question of such paramount importance. It is a question which ought to take precedence of every other; for, without arriving at a satisfactory solution of it, but little can be done to relieve the agricultural interest (Hear, hear).

The Hon. Mr. Wilson said: I felt great pleasure in finding this subject placed on the card for discussion, having long been convinced that there was no question affecting the interests of the country at large, and especially those connected with land, of more importance than that of taxation. It is not my intention to intrude many words upon you. I must be allowed to correct what I consider an omission on the part of the gentleman who has so ably addressed you for the last few minutes. When speaking of the period at which the wages of labour were 1s. per day, he should have reminded you that at that time manufactures were in their infancy, and that the wife and children were earning a little by spinning, &c.: children, eight years old, 4d. a-day; others, 2d.; and so on; so that, in point of fact, though the farmer paid only 1s. a-day wages, the actual amount obtained by the agricultural labourer and his family was perhaps 2s. a-week more. (Hear, hear). Mr. Cheetham has quoted from the excellent little work of Mr. Saunders. I there find it stated, in reference to the claim of the poor on the land, that the payment of a labourer when he is in full work amounts to the rental of 6½ acres. I would here call your attention to a fact which shews how intimately local taxation enters into farming produce—namely, that when any one is thinking of taking a farm, the first question he asks respecting it is, "What is the amount of the poor-rate? how many labourers is it necessary to employ here?" well knowing that he must pay not only according to the work which he may actually require, but in order to keep the poor out of the workhouse. (Hear, hear). Far be it from me to say anything against the manufacturing interests, because I know that they are in the main identical with our own. I would not, if I could, do anything which would make the two bodies antagonistic. On this point, however, I would mention what was stated by one of the largest and most influential of the manufacturers of the town of Leicester, at a public meeting last week. He remarked that things could not continue as they were, in consequence of the depression of agriculture. His own orders were, he said, decreasing; and the reason assigned was that the people could not pay. Now, I know that one great reason why people cannot pay is that in many districts there is a great pressure of poor-rates. Where people are unemployed in the ordinary way they must be put upon the highway-rates, or supported in some other way. Mr. Spachman states the local direct taxation at £14,320,000, and the rateable value of real property at £62,545,000, on which the burdens, including tithes, exceed 23 per cent. We find that the land-tax, the highway-rate, and the church-rate amount to £9,687,000. Thus there is paid an income-tax of 15 per cent; yet we complain of an income-tax of 3 per cent! I can see no reason why the whole taxation of Great Britain should not be revised and made to rest on an intelligible principle (cheers). I cannot understand, for instance, why the poor-rate should not be levied on every description of property. I do not regard that as an equivalent for the loss of protection, but I could never find a man who was able to urge any reasonable argument why the poor of the nation should not be supported by the nation at large (Hear, hear). I have trespassed further than I intended, but I thank you for the patience with which you have listened to me.

Mr. Mechi; I think you have got into a fog on the subject of taxation. In speaking of taxation generally it is impossible to avoid speaking of it in relation to its charge upon all the interests of this kingdom.

Mr. **Cheetham**: I don't think you ought to do so.

The **Chairman**: You can only speak of it so far as it enters into the cost of agricultural produce.

Mr. **Cheetham**: I strictly confined my own observations to that point.

Mr. **Mechi**: I have not said much on the subject yet (laughter). Taxation is an amount of money levied by the British people, to be repaid to the British people minus the charge of collection. My principal objection to taxation in relation to agriculture is, decidedly, its diminution of consumption. I apprehend that no man is prepared to stand up and justify the enormous imposition of 120 or 130 per cent. on the price of barley through the medium of the malt-tax. I confess that I consider that the most injudicious and the most oppressive tax. Beer is as necessary a commodity as bread to the agricultural labourer (Hear, hear). It is very well for those who drink wine every day, and enjoy all the luxuries of life, to say that beer is an unnecessary stimulant; but when we know that the agricultural labourer receives only sufficient money to supply him with bread and an occasional slice of pork, we may be quite sure that some stimulant is desirable. The tax upon barley in the shape of malt has produced a most anomalous result. While we have seen consumption progressing with population as regards all other articles which are moderately taxed, we find that, with treble the population that we had when the malt-tax was imposed, there has been no increase in the consumption of malt. Now, I do say that that fact is of itself a most convincing proof of the injustice and impropriety of the tax. I feel strongly on this subject, because I feel sure that if you refer to the medical men in many districts they will tell you that the tax has had the effect of driving labourers to consume to a great extent the vile stuff called tea, which is really producing most distressing diseases. Hernia and debility have arisen to a great extent from the consumption of warm water, called tea, instead of agricultural produce. A reduction of the malt-tax would have the effect of increasing the comforts of the people: while enlarging the market for the farmer's barley, it would conduce very much to the physical strength and comfort of the agricultural labourer. I agree with my friend on my right (Mr. Bell) in the opinion that taxation presses equally on all the producing classes; and, although much has been said about borrowing money at 50, and paying it back at 100, we know very well that those gentlemen who lent their money at 5 per cent. in the time of war, on being paid off, were very glad to transfer their money to the Three per Cents. The man who formerly received 5 per cent. is now quite contented with 3.

The **Chairman**: Are you speaking of consols?

Mr. **Mechi**: Of 5 per cent. annuities. All these things adjust themselves in a great degree, and however we may grumble, I do believe that at this moment the general welfare of this country is quite as great as it has been at any period within our recollection. If the labourer's daughter formerly knitted stockings, she can now buy them at about one-quarter of the cost that she had to pay for the materials. I believe there never was a time when the majority of the people of this country were so well fed, so well clothed, and so well housed, as they are at this moment. The malt tax, we are all agreed, is a desperate nuisance, and I think that is the principal grievance that we have. With regard to the poor-rates, it is quite clear that the land is compelled to support the unemployed—I do not say the farmer, but the land. It is also quite clear that land which is charged with a larger amount of poor-rate, in consequence of the low state of farming, or of the neglect of the landed proprietor, will let for less money than land which has been under an improved system of cultivation. But I cannot admit that the taxation on land, with the exception of the malt tax, is greater than that on any other kind of property. If the poor-rate is diffused over all the property in this kingdom, what will be the result? Your stock-in-trade will of course be charged, as well as that of the manufacturer. Every farmer will have to bear a relative proportion under that head, in addition to the charge on the rental of the land. I do not object to the poor-rate being distributed over the whole property of the kingdom. I consider that funded property ought to pay as well as other kinds of property (Hear, hear). It is unjust that it does not. The fundholder ought to contribute his share, especially as his property is peculiarly dependent for its security on the peace and tranquillity of society. These are my sentiments on this subject. I should be sorry to deny that there is a self-adjusting principle at work. I am not one of those who consider taxation the most dreadful of all evils. The man who pays taxes takes money out of his pocket and goes to the bank to receive it back again in the shape of an annuity. The great evil of taxation is, that it diminishes consumption, and encourages government patronage, and other things which are individually injurious to the nation.

Mr. W. **Bennett** said: It is not my intention to occupy your time at any length on this occasion, especially as the subject has been handled with so much ability, and so much to my satisfaction. I concur entirely in the judicious observations of the gentleman by whom the subject was introduced; and I think Mr. Baker and Mr. Bell, who followed him, have said much which tends to throw further light on the subject of taxation. Mr. Wilson touched very well on the subject of the poor laws. I have myself bestowed a little attention on the unequal operation of the poor rates, and having ventured to introduce them as a subject of discussion, at Cambridge, among a class of gentlemen who are not particularly favourable to our views connected with land, I am happy to say I so far succeeded in convincing them that the present system of poor rates, and the other local taxation of land, are grossly unequal, that at a large meeting the point was carried, and it was declared that there ought to be an alteration. There can be no doubt that they who possess the means should support the burdens of the state. We go, upon the broad principle that government exists for the benefit of property; and that, therefore, property in general should be taxed in the best form in which it can be got at for the exigencies of the state. If we examine the poor rate we shall find that that burden is not borne in anything like a just proportion at present. The annual rent of a tenement is no proof of ability to maintain the poor. Take the town in which I reside; I see a wealthy company of bankers in one street carrying on an immense business, and the whole of the premises occupied by them are assessed at £60 a year. They pay 1s. rate; £12 a year is all that that wealthy establishment pays towards the maintenance of the poor. Pretty good land in the same parish is assessed at about £2 per acre, and the burden of poor rates is of course very much greater. This question I hold to be one of vital importance. If we are to have equal laws there must be a revision of the present system of levying poor-rates. Take any description of premises in a town. If a rich lawyer or an extensive land-agent wants an office to carry on immense business, he pays scarcely anything towards the maintenance of the poor; whereas a person who occupies on a larger scale pays an undue proportion. It is evident, and there would be no difficulty in proving any where, that the present assessment is most unequal and unjust.

My friend, Mr. Mechi, observed that if property in general were charged, our stock-in-trade would have to be brought into account. I have no objection at all to that; but at the same time I think there is a much stricter, simpler, and better mode of getting at the proper share of all in the maintenance of the poor, namely, by ascertaining, as far as possible, the income of each individual. There is, I know, great difficulty in getting at the value of stock-in-trade, and I do not think it is necessary to do so. I was particularly struck with Mr. Mechi's observations as to the flourishing state of the country. (Hear, hear.) It is a marvellous thing that we do not hear of this from half a dozen farmers in the kingdom. Whether we are the stupid dolts for which some people take us I cannot say; but it is really marvellous that in the length and breadth of a land in which there are so many men of talent, capital, and public spirit, you will not find half a dozen people who will not tell you that they do not remember greater depression than there is in the agricultural districts at this moment. (Hear, hear.) It is monstrous that such statements should be made at meetings of farmers. If there be prosperity in some departments it is, I believe, only temporary; it exists only because they have not yet experienced the consequences of the depression which has fallen upon agriculture. You all know my sentiments with regard to the malt-tax. I regard it as an abomination. I so regarded it before we had free trade, and I consider it a double abomination now, and no Parliament ought, in my opinion, to tolerate its continued existence. See the awful consequences of the present state of the law. The barley brought to Cambridge, which is not one of the worst markets in the country, has not of late averaged 20s. a qr., and yet barley cannot be converted into malt without paying a 22s. duty. We are not permitted to make beer without paying this heavy impost; after the maltster has selected the finest samples we may give the rest to the pigs. I am aware that in the cider and the fen districts there is less anxiety on this subject, because it is supposed that a change would not benefit them; but my conviction is, that the present system affects the price of wheat; and it is a gross injustice to call upon us to compete with the foreigner, standing side by side with him in our own market, and at the same time to lay this heavy tax upon the conversion of our own produce into what we want for the use of our own families. That these things do enter into the cost of production no man who looks fairly at the question can for a moment doubt. If past experience could warrant us in hoping for anything at all, I might hope that some of the sentiments which have been uttered here to-night would be useful in higher quarters, but I confess that I have not any such anticipation. (Hear, hear.)

Mr. **Wood** said: I quite concur in what has fallen from Mr. Cheetham and Mr. Baker; and I will not occupy your time by going over the same ground as they have done. Enough has been said to prove the pressure of taxation as regards agricultural produce; but I apprehend that something farther was intended by the question placed upon the card; it must bear some reference to our means of obtaining a price to cover that taxation, otherwise the tax on malt might be said to be a tax on the maltster, which it really is not, as he has the means of obtaining it from the consumer. (Hear, hear.) Now, I observed a leading article in the *Times* of Friday, with regard to the deputation which had visited the Chancellor of the Exchequer to ask for the remission of the tax on paper, or, as it is termed, the tax on knowledge (laughter). In that article it was observed that the *Times* newspaper itself was taxed to the teeth; that all the employers had to pay customs duties and other taxes incident to their position, all of which increased the cost of producing the *Times*, but that, in fact, they were not worse off relatively than the rest of the community. They will tell us that we only prove here that we are taxed, but that the *Times* newspaper is also taxed. There is, however, this difference between the two cases: the *Times* newspaper is a thing which can be produced only in this country—(Hear, hear)—we cannot go abroad to obtain it; whereas, the agriculturist, wishing only to charge taxation prices in order to get back what he pays, the laws of his country will not allow him to do so, and the consumer goes abroad for that which the English agriculturist produces, because he can buy cheaper in other countries. (Hear, hear.) The laws of this country are founded in injustice; I believe they are also founded in ignorance. I apprehend that the question on the card has reference to the taxation of agricultural produce as compared with the taxation of other descriptions of produce—that is to say the taxation levied upon other industrious bodies of men besides agriculturists. I maintain that there is a necessity for some alteration, to enable the agriculturist to charge the taxes which he pays on his produce. No one can deny that the *Times* newspaper, although it may be taxed to the teeth, not being competed with by foreigners, is able to compete with similar descriptions of manufacture in the same market. The agriculturist stands in a different position, and therefore there is a necessity for some alteration. I do not go quite so far as Mr. Bell. I do not agree with him that we ought to have as high prices as we had during the war (Hear, hear), because here have been considerable improvements in the machinery employed in agriculture. If the amount of the circulating medium had remained the same, prices would, I think, still have fallen, because since the war there has been such a lowering of expense through the application of steam and other improvements which have tended to increase profits. But as to our remaining in the position that we are, it is impossible. I have no belief in the possibility of it, or in the common sense of those who believe that it is possible. I do not believe that those who say so think so in fact. I have very great doubts as to the honesty of many people in the present day (Hear, hear, and laughter). I cannot believe that they have so much ignorance as really to believe what they profess to believe. I repeat that I consider a comparison to be involved in the question on the card between other productions of industry and our own; and because we are not able to charge what we pay to the consumer, I think it is absolutely necessary that we should be placed in a different position.

Mr. **Baker** wished to say a few words in allusion to the remarks of Mr. Mechi. That gentleman had spoken of the fact of the per-centage paid on the funded property of this country having been reduced from five to three-and-a-half per cent. If he compared the depreciation of money at this moment with the depreciation at the former period, he would find that three-and-a-half was a larger interest now than five was then.

Mr. **Mechi**: You do not deny the fact of a reduction.

Mr. **Baker** continued: As to the poor-rate it was quite evident that if a larger breadth of property were taxed there would be less to pay on property of every description. Those were the two principal points on which he wished to set Mr. Mechi right. As regarded the employment of capital and the prosperous state of the country at that moment, he would observe that he happened to have been about a week since in the company of some very intelligent men of his own county—maltsters, millers, brewers, and others—when a conversation arose with regard to the course pursued by the Bank of England with respect to the discounting of bills. The question was then put whether, if any one took £500 from the Bank of England at three per cent., he could employ it for six months so as to take it back again to the Bank at the end of the period.

Mr. Williams said: I am sorry that I am not prepared with statistics to prove the assertions which I am about to make. Though I am not prepared to say to what extent taxation enters into production, I will refer to some items into which I know it does enter. Notwithstanding what has been said this evening, I think there is such a thing as a natural price and such a thing as an artificial price of land. The landlords of this country are by taxation placed under the necessity of asking for more rent than any other land in the world of the same description would pay. Rent is not a small item, and nothing is more clear than that if a landlord is possessed, for example, of £2,000 a year, the expenses incidental to the maintenance of his position in society, the taxes on his horses, dogs, carriage, and so on—everything, in fact, except his bread and cheese, are thrown upon him to a considerable extent by the Government. Then there is the tithe-owner, who is also taxed for almost everything that he makes use of. I do not expect to be able to state the full extent to which the poor tenant-farmer is taxed; but I will attempt to do it, in order to shew that Mr. Bell is utterly mistaken in supposing that taxation presses equally on consumers and producers.

Mr. Bell: I said on all producers.

Mr. Wood: Not to an equal extent. I think I can prove that the tenant farmer is made to bear, indirectly, near all the taxes which press upon the energies of this kingdom. Sir Robert Peel, when he introduced his income-tax, to rescue this country from the dire effects of Whig legislation, in order to make the dose palatable, said to the House of Commons, in effect, "I know I am offering you a bitter pill in proposing this tax; but mark, I am going to accompany it with such an antidote that you won't perceive its operation." Now if this £5,000,000 of income-tax does not rest upon the landlord, nor upon the tithe-owner, nor upon the consumer, if free-trade measures prevent it from bearing upon the country generally, I maintain that the British farmer pays the whole of it (Hear, hear); and the price of our produce will bear me out in this statement. It is now reduced full 30 per cent. below what it was when Sir Robert Peel made use of this argument. The tenant farmer has, then, to pay the whole of this tax; besides having to pay schedule B. for himself, he has to pay schedule A. for his landlord (Hear, hear). Nor does the evil stop here. There is the poor labourer—what amount does he pay? I agree with Mr. Cheetham that Mr. Saunders's argument is a thoroughly practical one, and I must assume that the labourer pays a tax equal to 33 per cent. The poor labourer has been gulled into the notion that this cheap system would be a benefit to him, and that he would be better off under low prices—let his wages be what they might—than if he paid a moderate or proper sum for his loaf. But the cheapness of his loaf does not depend upon the price which the labourer pays for it. That is the cheapest loaf for him which, after providing bread for his family, leaves him the largest amount of money in hand (Hear, hear). Let me ask you if the British labourer is not now deprived of every description of beverage in this country except water. He may get other things, but if he does so it is at the expense of his stomach. Now what taxes does the labourer pay? If he purchases the beer which is necessary for himself and family he has to pay a tax of cent. per cent.; the article is, in fact, so highly taxed that he cannot get at it. Then if he turns to that trash which is called tea, let me ask if it be not the fact that the labourer pays precisely the same amount of duty for the worst description of tea, for an adulterated article, as the greatest nobleman pays for the best kind of tea. The tax paid on a pound of tea is 2s. 1d., while the cost price of the article to the labourer is about 4s. If you take into account the original cost of the article which the labourer thus consumes, the charge for transit, and the wholesale and retail profits, and then add 2s. 1d. for duty, you will be able to judge of the burden which oppresses the labouring population under this head. Such, in fact, is the position of the labourer, that unless he can keep a cow, and obtain a little milk and water, there is no beverage in this country which he can consume, except water, which is not taxed cent. per cent. I maintain that labour is an article which enters most materially into the cost of production, and that it does so to the extent of two-thirds. If this be so, how can it be expected that wheat should be brought into the British market by the British farmer and sold at the natural price? Why, is there anything natural in it? Is there anything natural in the competition in which the British farmer has to engage? (Hear, hear). I maintain that there is nothing natural in it, and the country is, in my opinion, under a complete delusion with regard to the distinction between natural and artificial prices, and it is only by means of delusion that the Malt Tax has been continued in this country. The raw material of barley costs at this time on an average less than 20s. per qr. When the maltster purchases that to make into malt he incurs a direct tax of 20s. 8d. When he has converted it into malt, the price is raised to 50s. When he goes with it into the market her Majesty's subjects do not object to pay him the taxation price of his manufactured article. They do not grumble at his charge; they say, "We see that you have got to pay 20s., and that 20s. 8d. is added, and we do not object to 50s. or 52s. as the cost price of the article which you have manufactured." Now I maintain that it is utterly impossible that the manufactured article of bread can be sold in this country at what is termed the natural price. As to our friend Mr. Mechi, I must say that the more I see of him the more I admire the friendly spirit which he always exhibits, and at the same time the more inexplicable appears his confidence in his scientific principles (Hear, hear, and laughter). He has asserted before to-night that he does not fear to grow wheat under free trade. I have to-night heard him say that he does not think taxation at all hurts the British farmer, and that he does not consider it such a bugbear as it appears to some people. I have arrived at the conclusion that her Majesty's assessor has not yet found his way to Tiptree Hall; otherwise he would not have ventured upon the experiment of attempting to make five rents at 43s. per acre. Mr. Mechi said that the labouring classes were better clothed, better fed, and better housed than they ever were before. I don't know how the case may stand in his neighbourhood, but I will state this fact:—Last Friday night, when I paid my labourers, and I beg to say that we only pay 6s. a week in Wiltshire—(cries of "Shame!")—one of them asked me how I thought it possible for him, his wife, and six children to live on 6s. a week. His name is Russell. I said, "Of course it is utterly impossible; but have you really six children?" "Yes," he replied; "I have two grown-up girls who used to earn something at stone-picking; but now they have no work, and we have actually been living since Christmas on 6s. a week." I assert that labour constitutes two-thirds of the cost of a quarter of wheat. If you take two-thirds, with wheat at 56s.—and, remember, Sir Robert Peel said it was impossible for the farmer to grow wheat at a profit under that average price—you will find that that will pay four men weekly nearly 9s. a week. But if you take wheat at 36s.—and I maintain that the average price of wheat in this kingdom is not more—you will find that 24s. is two-thirds. Ever since the Government said last year that the workhouse was the test of the prosperity of the country, I have come to the determination that I will employ no more labour than I can employ to advantage. It is not to be expected that the farmer will sell labour for less than he gives for it. If this free trade is to abide the test of experience, let it stand or fall by that. Let the tenant-farmer pay for the labour the precise sum which he is bound to pay; let him pay what he receives for it when he sells it again, and no more.

Mr. Tattersall said, no one who had listened to the discussion could have done otherwise than feel that the subject had been handled very ably. But there was one point which he wished to put in a stronger light than it had been, and it had reference to the malt tax and to the question of prices. There was a very ingenious assertion made by Mr. Hudson at the last meeting. Many persons in the country, not understanding the subject, appeared to believe that if a certain amount of money was invested in farming, it would as surely produce a proportionate return as if it was employed in manufactures. Now, Mr. Hudson had proved from his own experience that such was not the fact. He was one of the highest farmers in England; and he stated that having grown 300 acres of barley last year, he found not a single coomb fit for malting purposes (Hear, hear). There could be no mistake on the subject. It was easy to make assertions; but here was one of the best farmers in the country contradicting what was so confidently asserted, and that fact appeared to him quite conclusive.

Mr. Cheetham then replied. He said it did not often fall within his province to appear in the position which he had occupied that evening; but he had never felt more gratified than at the manner in which the question had been discussed. The hope which he had expressed in his opening observations, that many practical remarks would be elicited by them, had been fully realized; and he felt indebted to those who had thrown so much light on what he confessed appeared to him a rather intricate subject. Mr. Baker seemed to imply that the poor-rates had not been sufficiently taken into account in dealing with this question. If he looked at the estimate which he (Mr. Cheetham) had presented, he would find the poor-rates included in the amount of taxation.

Mr. Baker said he had not referred to that club, but to the public at large. With respect to the question of wages, notwithstanding what Mr. Bell had said on that subject, he was convinced that in 1792 a shilling a day was an ample sum. It was to be remembered that at that time manufactures were in their infancy, and that the labourer's family were enabled to eke out the wages to 9s. or 10s. a week. He had heard labouring men frequently complain, when receiving 12s. or 14s. a week, that they could not live so well as when they received only a shilling a day. As regarded Mr. Mechi, he must confess that he was surprised to hear him talk as he had done about the flourishing state of the country. He now began to suspect that that gentleman wrote the leading articles in the *Times;* for he understood that in an article in the *Times* of that day, it was alleged that at no previous period of our history had the country been in so flourishing a state. He agreed with Mr. Mechi heartily, however, in his condemnation of the malt tax. He could wish that one of its worst effects was, that it drove people to the alehouse; but when he knew on the best authority, that along with the spread of teetotalism, and the diminished use of malt liquor, the consumption of that vile narcotic, opium, had increased in an extraordinary degree, he must say that that fact should be enough to rouse the indignation of any honest man at the continuance of the malt tax. Mr. Mechi had observed that if property of all kinds were charged with poor-rates, the farmer's stock-in-trade would of course be included. He (Mr. Cheetham) could see no objection to that. The charge could not in that case be made upon rent; the farmer could hardly be made to pay double. Mr. Bennett had alluded to the cider and fen districts as not caring about the repeal of the malt tax. He had no doubt of the correctness of the statement, but then the fact was one of the strongest arguments for the removal of the impost; for it showed that its pressure was unequal. Mr. Williams had spoken of landlords in connection with the cost of production. He (Mr. Cheetham) did not hesitate to say that in the first instance he put down the landlord as one of the sources of the cost of production; but a friend remarked to him that he thought it was injudicious to do so, inasmuch as the tax on the production of corn was paid before the landlord, and that it did not necessarily follow that the landlord would expend his money on exciseable commodities. That the landlord did so, however, was certain; and he agreed with Mr. Williams that the landlord could afford to let his land for much less, were it not for the cost of taxation.

Mr. Wood said it must be recollected that the landlord had always one heavy item of direct taxation to meet in the shape of land-tax, which had, he thought, been entirely omitted. On a little estate with which he was concerned, in Berkshire, there was a direct land-tax of £20. He assumed that on other estates the burden was proportionate, and that landlords had all a heavy item of land-tax to pay to the Exchequer.

Mr. Cheetham said of course that was important, and ought not to be lost sight of. The tithe-owner stood in the same predicament, perhaps, as the landlord; but in the estimate which he had given he had placed the tithe-owner amongst the payers of direct taxes, and it would be right to charge his burden a second time. There were no further remarks which it occurred to him to make. His task had been a comparatively easy one; he had had no difficulty in convincing them that the taxation which bore upon the cost of agricultural produce was a grievous burden (cheers).

The Chairman said he thought it was to be regretted that gentlemen who undertook to occupy the position which Mr. Cheetham had done that evening, did not come prepared with a specific proposition, embodying what they conceived would be the views of the meeting. After listening carefully to the discussion of that evening, he thought he could perceive two different things, leading, as it were, to the same end. Mr. Cheetham and Mr. Baker had both pointed out very properly and with great force the direct taxation which bore upon British agriculture; Mr. Bell had pointed out with equal force how the war prices of produce rose in proportion to the increase of taxation, and had shown that while, since the war, the value of produce had depreciated very greatly, the taxation had diminished only in a very slight degree. It thus appeared that British agriculture was oppressed, not only by the almost undiminished pressure of direct taxation, but also by the change in prices; and it was attempted to be shown that money now represented three or four times the amount that it did when the burden complained of was imposed. Now, in order to embody the feeling of the club on the subject, he had drawn up a resolution, which he would now submit. It was as follows: "That although this club will not undertake to define the amount of the taxation which enters into the cost of agricultural produce in the United Kingdom, yet they fully concede the fact that those taxes which peculiarly affect such productions have altogether escaped that revision which the altered state of the customs' duties from the year 1846, and the unaltered interest in the funded debt since that time, imperatively call for." With regard to the malt tax, he must say that, having been for many years a practical agriculturist, he could not shut his eyes to the working of such an extraordinary and iniquitous impost. In looking over the works of Mr. Montgomery, he had found that since the reign of William and Mary there had been scarcely any increase in the consumption of malt; that with a duty of 4s. a quarter, and a population not more than one-third of the present amount, there was nearly as much barley malted as there is now. When they found, in regard to the operation of the excise duties, that the increase of consumption was almost in exact proportion to diminution of duty, he thought they were warranted in concluding that if it were not for the duty the consumption of malt, instead of remaining at little more than four million quarters per annum, would be trebled or quadrupled. (Hear, hear.) The farmer lost chiefly by the inadequacy of the demand. If he grew barley to any considerable extent, the Government stepped in, and prevented him from selling it. Was that just? It was well known that the moment malt was put on board ship the whole amount of the duty paid was returned. In every point of view he considered the operation of the malt tax most injurious to the farmer.

Mr. **Mechi** seconded the motion.

Mr. W. **Shaw** begged to say that he entirely concurred in the principle with which the resolution started; but, without being considered as concurring in the view taken by Mr. Mechi, he must say that he thought it always desirable to disarm those who might be disposed to cavil at at their statements, or to seize any opportunity of weakening the position they took up. That was a point which he had always kept steadily in view. He would, therefore, suggest an alteration in the latter portion of the resolution. He thought the first part of it exceedingly good; but the concluding part opened up one of those questions which were mooted by the great parties in the country at this moment; and it appeared to him that, by adopting it, they might weaken their own position. He would suggest that the resolution should stand thus:—

> "That although this club will not undertake to define the amount of taxation which enters into the cost of agricultural produce in the United Kingdom, yet they fully concede the fact that those taxes which peculiarly affect production are extremely oppressive, and require immediate revision."

Mr. **Trethewey** seconded the amendment.

Mr. W. F. **Hobbs** was not one of those who desired to cause dissension, but he considered the period to be one in which they ought to speak out plainly. Although he admitted that the resolution of Mr. Thomas was a very good one, he thought it did not express with sufficient strength the feelings of the cultivators of the soil. Mr. Shaw had gone a step further, but even he had not gone far enough. He considered this question one of so much importance that, if the farmers were not relieved in some way very shortly, the taxes levied upon them could not be paid for many months. There is a strong feeling arising in the country that, unless the occupiers of the soil obtained relief soon, there must be a combination amongst them; and in the city of London there had been an indication that such was the tendency of things. The cultivators of the soil had a right to express their opinions strongly (cheers). He was very glad that Mr. Cheetham had brought the subject forward in the way that he had done. He had hoped to hear a clear definition of the taxation which entered into the production of the quartern loaf—a point which had engaged the attention of the late Lord Western and other friends of agriculture; but, as the matter stood, he considered it their duty to express their determined opposition to a system under which so unjust a proportion of taxation was levied on the occupiers of land. He would now propose the following amendment:

> "That although this club will not undertake to define the exact amount of taxation which enters into the cost of agricultural produce in the United Kingdom; yet they are of opinion that those taxes which peculiarly affect those productions are now become intolerable, by the great depreciation in the price of corn and cattle, and therefore require immediate removal."

The amendment having been seconded, Mr. **Bennett** observed that, if the word "revision" was adopted, it might be said that all the tenant-farmers asked for was a revision of taxation. Although they had a right to demand a revision of taxation, and although in his opinion that must be the fulcrum by which to get back revenue duties on foreign produce, he would be sorry if it were supposed that they would regard it as a compensation for the strange alteration which had been made in the customs' duties.

The **Chairman** said: There was nothing at all on the card about protection to agriculture; the question was, the cost which entered into production.

Mr. **Williams** would suggest the following to form the concluding part of the resolution: "And they are of opinion that the present position of the farmers of the United Kingdom calls most loudly on her Majesty's Ministers to reduce those taxes which press most forcibly on the agricultural interest, namely, schedule B in the income tax and the malt duty."

Mr. **Baker** would suggest the following words: "That inasmuch as taxation is proved to enter largely into agricultural produce, it is incumbent upon the legislature at once to remove it from all articles entering into such cost of production, or to impose an equivalent amount upon all grain and agricultural produce imported into this country."

The question was then put, and on the show of hands, the amendment of Mr. Hobbs was carried, the numbers being 15 for and 2 against it.

On the motion of Mr. Bennett, a vote of thanks was given to the Chairman, and on the motion of Mr. Mechi to Mr. Cheetham.

DAIRY FARMING ON ARABLE FARMS IN WIGTOWNSHIRE.

BY JAMES CAIRD, ESQ., BALDOON.

The system of dairy farming, as carried out on arable farms in this and the adjoining counties, is frequently combined with the rearing and feeding of stock. The progress of agricultural improvement, and increasing extent of green crops, enables the farmer to unite the two systems, by which he obtains both a better variety of produce for the market, and of stock for the farm, than is offered by the more common plan of dairy farming exclusively. But, in particular situations the latter system is alone practicable, and the nature of the farm will, therefore, decide the mode of management.

The Ayrshire breed of cows is, almost exclusively, the kind used on dairy farms in this district. Breeders have long directed their attention to the perfection of this animal as a milker; and the large stock of cows kept by the dairy farmers in the west districts of Scotland afford great facilities for commencing the dairy system. The Ayrshire cow is a hardy animal, of small size, but yielding largely in proportion to the food she consumes; easily fed fat, when no longer profitable as a milker; and producing a very thriving half-bred animal when crossed with a good shorthorn bull.

In proceeding to stock a dairy farm, the usual mode is to buy from the breeders, in the month of April, a lot of Ayrshire queys (heifers), which have just completed their second year. If the farm is entered to at Whitsuntide, they are put on the grass; the bull admitted to them about the middle of July; they are grazed during summer and autumn, and housed for the winter about the beginning of November. If the farm is entered to at Martinmas (November), the stock should be purchased at that time, after having received the bull, as it is of importance to have it accustomed to the farm for some months before the period of calving. A dairy stock seldom thrives well immediately after being removed to a new farm; and this is, of course, more severely felt by the farmer if the cows are shifted about the beginning of summer, while they are in full milk, as they are then easily affected by a difference of water or pasture. In the end of autumn, the queys, when taken up from the pasture, are housed at night, fed on turnips and straw, and let out for water and exercise, for an hour or two during the day, in winter. They are accustomed to be gently handled in the byres; and, as the period of calving approaches, they are carefully watched. After calving, the calf is immediately removed; the usual management of newly-calved cows (which need not here be detailed) is adopted; and, as soon as the pasturage is ready, the cows are turned out during the day to grass. They are brought into the byre morning and evening, at regular hours, to be milked; and, during very hot weather in summer, if annoyed by flies, they are housed for a few hours in the middle of the day, receiving cut clover or vetches. The second summer, the bull is admitted about the end of June or beginning of July, so as the cows may begin to drop their calves in March and during April; but this is regulated by every farmer as best suits his own position, it being found advantageous where there is a demand for milk, and when early feeding can be had, to have the cows to calve early; while, in more remote situations, where there is no extensive demand for milk, it is more economical to have the cows to calve only a week or two before the grass is ready. When the cows calve early they are well fed; receiving, in addition to a full supply of turnips, bean-meal or other farinaceous food, for the purpose of keeping them in high milking condition, till turned out to grass. Cows should be kept in good thriving condition up to the period of calving; after that they should be in every way as well fed, and with as much variety of food, as the means of the farmer admit; they should be clean and comfortable, and in well-ventilated byres; when at grass, the pasture should be rather understocked, and the cows housed in either very hot or very cold weather, and at once supplied with extra food, such as cut clover, or vetches, or early rape, and turnips, whenever the pasture ceases to afford a full bite; and in proportion to the judgment with which these details are attended to, will be the success of the dairy farmer. On large arable farms, where a dairy stock is kept, the cows are frequently let or *bowed* to a dairyman or *bower*, who, on certain terms of feeding, &c., agrees to pay a fixed rent for each cow, and manages all the details of feeding the stock, and of manufacturing their produce. The usual amount of feeding agreed on is, sufficient pasture during summer, with fodder in winter, and four tons of turnips (one-half swedish), and two bushels of beans, ground, to each cow, dairy utensils, and accommodation, a dwelling-house and garden, and generally, a certain quantity of potatoes for household use, being also provided; and for this the dairyman or *bower*, binds himself to pay so much for each cow (from £7 to nearly £9 in this district), according to the quality of the stock, and their food, and the proximity of good markets. This is found a very convenient division of labour, as attention to the details of dairy management is incompatible with a like attention to the details of an arable farm. Old cows, and such as prove bad milkers, are fed off and sold, and their place supplied by young cows, either reared on the farm, or bought from a breeder. In settling with the bower, three queys (that is cows with their first calf), are reckoned as equal to two cows, and farrow cows as equal to queys.

On farms where the mixed system of dairy and feeding is adopted, the management of the cows is the same as already described, except that the bull is admitted early enough to have the calves dropped during the months of February and March. To obtain early maturity, upon which great part of the success of this system depends, a shorthorn bull, of good symmetry and breeding, is used with the Ayrshire cow; and the half breed produced from this cross, if well attended to, can be sold fat at the end of its second year. For the first six weeks the calf receives as much new milk as it can drink, and, if the cow is fed on rich food, viz., bean-meal, along with a full allowance of turnips, about the half of her milk will satisfy the appetite of the calf, the milk being, under this treatment, very nutritious. If the cows are let to a bower, a fixed price, generally 10s, is allowed to him by the farmer for each calf when dropped; and the value of the milk, which is regularly measured over to the person who feeds the calves, is deducted in their annual settlement. After the first six weeks, the new milk is partly withdrawn, and the calf then receives, as a substitute, boiled linseed in warm skimmed milk; as soon as it can eat, a little oilcake is given in its trough, with cut turnips and hay; and when turned out to grass, which should be young and juicy, the oilcake is continued by the best feeders. In winter it gets as much turnips as it can consume, with an allowance of $1\frac{1}{2}$ lb. of oilcake per day; it is grazed on a full bite of pasture during the summer; and finished off the second winter with turnips, and about 3 lbs. of oilcake per day. When the system is carefully carried out, the two-year-old will then weigh from forty-five to fifty-five stones of fourteen pounds, and sell for from £14 to £18.

The union of the two systems, of dairy and feeding, is extending among judicious farmers, on the better class of turnip soils. It enobles the farmer to be less dependent on a single variety of produce, and affords a better division of labour, inasmuch as, in summer, while the details of the dairy demand full attention, the young stock are at pasture; and, in winter, while the feeding of the young stock is the chief employment, the dairy is nearly in abeyance. By the following calculation there appears, however, to be a considerable difference in the economical value of the two systems:—

Expense of Feeding, and Produce of a Dairy Cow.

	£	s.	d.
Pasture &c., $1\frac{3}{4}$ acres, at 30s...........	2	12	6
Winter feeding:			
Four tons of turnips, at 10s.......	2	0	0
Two bushels of beans, at 5s.......	0	10	0
	5	2	6
Rent paid by bower	8	0	0
	£2	17	6

Expense of Feeding, and Value of a half-bred Ox.

Price of calf	£0	10	0
Value of milk, &c, for rearing it........	2	0	0
Grass and oilcake to November	0	10	0
First winter—3 tons turnips, at 10s. ..	1	10	0
„ 2 cwt. oilcake, at 10s.....	1	0	0
Grass, second summer, 1 acre	1	10	0
Second winter—7 tons turnips, at 10s...	3	10	0
„ 5 cwt. oilcake, at 10s...	2	10	0
	13	0	0
Value of ox when fat	16	0	0
	£3	0	0

The dairy cow thus gives a return of £2 17s. 6d. for *one* year's outlay of £5 2s. 6d.; while the half-bred ox, in *two* years, yields only £3, from an expenditure of £13. No charge, in either case, is made for fodder or litter; but the superior quality of the dung made from the more richly fed stock may indirectly compensate the feeder for the loss he appears to sustain by his system.

There are two kinds of farms on which a union of the systems cannot be adopted with advantage. These are stiff clays, on which only a small breadth of turnips can be raised; and dry turnip soils of inferior quality, which require sheep feeding to maintain their condition. 1. On a farm of stiff land, for example, extending to 300 acres, there may be a fifth, or sixty acres, in fallow and green crop. A farm of this size should afford pasture for seventy dairy cows, requiring from ten to twelve acres of turnips for winter food. The same pasture would keep a dairy and feeding stock, which could not be fed in winter on less than three times this extent of turnips. Now, it might be possible, with ample manuring, to grow a fifth or sixth part of the fallow break with turnips to advantage, while it might be very imprudent, if not impossible, to attempt to force the growth of so great an extent as three-fifths on this different kind of land. 2. On a dry turnip soil of inferior quality, having sixty acres in green crop, forty-five of which may be in turnips, one-third will be sufficient for a stock of seventy dairy cows, and two-thirds will remain in the land to be consumed by sheep. The high condition thus imparted to the soil will render it capable of yielding excellent pasture to the cows, which it could not do if the turnips were all carried off the land. But a union of the two systems would require that the whole turnip crop be consumed by the cattle, while, in that case, the farm would have no pasture of corresponding quality to carry them through the summer.

In the system I have described, the general mode of management among dairy farmers has been adopted. But this is capable of much improvement; and greater attention is yearly being paid to economising food and warmth by house-feeding, and to the advantage of presenting a *variety* of food to the milch cow. Attentive observation leads to amendment in all details, and is followed by increased returns; and I can say, from my own experience of the Ayrshire dairy cow, that I know no kind of stock which will better repay care and attention, or yield an ampler return for the same outlay of capital.—Morton's Cyclopedia of Agriculture.

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

(From the Morning Chronicle.)

Letter XVI.

NORFOLK, SUFFOLK, AND ESSEX.

Following out the plan which I had prescribed to myself, I now proceed to give the results of my inquiries into the condition of the labouring classes of the county of Norfolk.

This county is one of considerable extent: there are but three counties—viz., York, Lincoln, and Devon—which are of greater dimensions than Norfolk. Its area comprises 2,024 square miles, or rather more than 1,290,300 statute acres. On its northern and eastern side it is bounded by the German Ocean. The Wash separates a portion of the western part of the county from Lincolnshire, and the Ouse divides the remaining portion on the same side from Cambridge, while the Waveney and the Little Ouse divide it on the south from Suffolk. Its greatest length from north to south is about seventy miles, and its breadth from east to west about forty-two miles. The small rivers which run through the county, such as the Wensum, Yare, Waveney, Bure, Ant, and Thirne, afford great facilities for inland navigation. There are about 170 miles of railway constructed, which connect together all the most important towns. Two lines of communication are opened with London—one by the Eastern Union system, and the other by the Eastern Counties; and by means of the Norfolk railways the whole of the manufacturing districts are brought into connection with the county.

The population of Norfolk in 1841 was 412,664—of whom there were, above twenty years of age, 94,982 males, and 95,967 females: while of those under twenty, there were 104,119 males, and 117,596 females. 384,594 of the persons so enumerated were born within the county, and 28,070 elsewhere. Between the years 1831 and 1841 the rate of increase in the population appears to have been checked in a most remarkable manner. In 1811 the population was 291,999, being an increase of 18 per cent. as compared with the previous ten years. In 1821 the number was 344,368, an increase of 13 per cent. over the previous decennial period. In 1831, 390,054, or an increase of 13½ per cent.; while in 1841, the rate of increase was found to be only 5¾ per cent., the population having only increased during the ten years to 412,664. The number of inhabitants to 100 statute acres in Norfolk, according to the census of 1841, was 31·9, being a proportion of not less than 25·8 per cent. below the average of England and Wales; there being fifteen other English counties with a less number to 100 acres—one county, viz., Sussex, having the same number—the remainder having in each case more than Norfolk.

The estimated rental of the county is £1,957,822, the assessed rental £1,928,422, and the amount assessed to the property and income-tax £1,972,558. The number of persons returned as "independent" in 1841 was 10,358, being a proportion of 10·4 per cent. below the average of England and Wales upon the same amount of population. The actual annual value of the real property assessed to the income and property tax in 1843 was £2,327,371, being a proportion of 4·55 per cent. of real property above the average for the like population throughout England and Wales. In 1831 there were only 6,168 depositors in the savings' bank of Norfolk, the amount of whose deposits was £198,554; in 1846 the number of depositors had increased to 19,250, and the amount of their deposits to £562,373. The mean amount of each depositor in 1841 was £31, and in 1846 £29.

Having thus briefly alluded to a few of the more prominent features in connection with the county of Norfolk, I am anxious, before proceeding to describe the condition of the labouring classes, to call the attention of the reader to the state of the ancient city of Norwich. There were, in 1841, in the city, 14,023 inhabited houses, and 812 uninhabited. The population was 62,344; of this number there were males under 20 years of age, 12,766; females, 13,807; above 20 years of age—males, 15,403; females, 20,268. Of the total number, 56,847 were born in the county, and 5,497 elsewhere.

In former times Norwich was particularly famous for its extensive manufactures of crapes and woollen goods. I was informed by Mr. Yarrington, who had been formerly extensively engaged as a manufacturer, that in 1791 there were not less than 100,000 hands employed in immediate connection with the establishments at Norwich. Great numbers of these persons were employed in the surrounding parishes, and many even in the county of Suffolk. At that time one firm alone exported annually 40,000 pieces to Germany, Spain, and Portugal; and upwards of 70,000 pieces of the coarser kind of goods were also required for the Russian trade. Since that period, however, the trade of Norwich has sadly fallen off. As you pass through the great majority of its narrow, gloomy, ill-paved, and irregularly-built streets, traces of ruin and decay everywhere present themselves to view; and there is no doubt that ere long, despite the exertions of a few capitalists, and even the recent infusion of new blood among them from London and elsewhere, the city of Norwich will lose its importance as a manufacturing place, and become the centre and capital of an extensive agricultural district.

Various reasons have been assigned by the manufacturers for the great falling off in the trade. The port, are considered to have had some effect in bringing about its present state. The high price which the inhabitants have to pay for coals, as compared with other manufacturing districts where coal abounds, has also placed them in a disadvantageous position. For a long time the manufacturers of Norwich held out against the introduction of steam power into their factories, and it is only within the last few years that it has been introduced to any extent. Their powerful rivals in the north did not fail to take advantage of this omission on the part of the manufacturers of Norwich; and in a short time the Paisley people were enabled to take the lead of them in nearly the whole of the markets. Another cause of the decline, which has been frequently stated to me, is to be found in the fact that the trade of Norwich is in the hands of so few persons. There are not more than a dozen manufacturers, and the majority of these are inert and apathetic. There is nothing in them of that "go-a-headism" which is to be found in the other large manufacturing towns in the country. Knowing full well that there is always an abundant supply of labour in the market, they delay till the latest moment giving out the work, and, until they "can safely feel their way," as they call it; that is, till they know that some particular kind of fabric will "take." The evil arising from the adoption of this course falls with tenfold force upon the unfortunate workpeople. Day after day, and week after week, they are compelled to drag attendance at the different factories for the purpose of obtaining a supply of work. The manufacturer declines to give out the "shoot;" there is nothing like constant employment for the people; they are driven to the parish for relief, and the enormous poor-rate of the city —at present not less than £40,000—is the burden imposed upon it owing to the want of energy on the part of the manufacturers. Another evil arising from this system is one which may be said to be felt more by themselves, although it ultimately falls upon the workpeople; that is, the comparative want of originality of design. There are one or two enterprising manufacturers among them, who at considerable expense produce new designs in shawls and dresses, some of them of a very beautiful character. So soon, however, as these articles make their appearance, the design is copied by others, and worked upon an inferior article—the market is glutted, prices fall—and the public having purchased inferior articles cease for the future to patronize the Norwich manufactures. Among some of the manufacturers there is a very strong feeling on the subject, and they entertain great hopes that the establishment of the schools of design will eventually be the means of remedying the evil.

The chief articles of manufacture in Norwich are woollen, silk, and cotton goods, crapes, paramattas, stuffs, camlets, &c.—the materials used being principally worsted and silk. Being anxious to see for myself the mode of employment at the principal factories, and the condition of the workpeople, I called upon the owners of the several mills, stated to them the object of my visit, and, in almost all cases, every facility was afforded me for obtaining the information which I sought.

The first mill which I shall notice will be that of Messrs. Grout, Martin, and Co., who, in addition to their factory at Norwich, have a very large one at Yarmouth, and another also at Ditchlingham. The number of hands usually employed by the firm is—at Norwich, 600; at Yarmouth, 800; and at Ditchlingham, 350; being a total of 1,750. The number employed at the time of my visit was considerably below the average. The first department into which I was shown was an extensive fire-proof store-room, in which were enormous bales of silk of different sorts, from Italy, India, and China. The first operation in connection with this manufactory consisted in sorting and dividing the various qualities of the silk—a process in which great care and discrimination are required. The silk, having been thus prepared, undergoes the next process—winding; an operation which is carried on in two large rooms, well lighted and ventilated, of 75 feet in length and 40 in breadth. There were engaged in this department about 80 persons, chiefly females, whose average earnings by piece-work were from 4s. to 6s. per week. From the winding-room I was conducted to the "throwing-rooms." There were two rooms in which this process was carried on, in each of which about forty persons were employed, many of whom were young girls, not exceeding eleven years of age. The lowest amount earned during the last week was 2s. 6d., and the highest 7s. 6d. The next stage consisted in winding the silk from the larger to the smaller bobbins, for the convenience of the "warpers." About eighty persons were employed in this operation, whose average earnings were about 6s. per week. The silk having been wound upon bobbins, or "horns," of the proper size, was then handed over to the warpers. The "warping," which in most factories is done by hand, is here performed in the most ingenious manner by steam-power. In this room there are about fifty of these small warping machines, each attended to by one person; and a small dial-plate attached to the frame, the hands of which are moved by gearing wheels, registers the number of yards made by each machine. In this room the average earnings were from 7s. to 8s. per week. The warp having been prepared, the next and final process of manufacture is the weaving. Leaving the warping-room, we proceed therefore to the weaving-room, where sixty power-looms are in almost constant employment. There was generally one person to each of these looms, but some of the most experienced and active hands undertook the management of two of them. There were a few learners also at some of them. The number of persons here employed was about sixty; and the highest amount earned during the week by the weavers was 8s. Some of the less skilful hands did not earn more than 4s. 6d. or 5s. The whole of the weaving in connection with this establishment is done on the premises, no portion of it being given out to the hand-loom weavers to work upon in their own homes. Every part of the establishment was remarkably clean, and the condition and appearance of those employed were calculated to remove a great many of the unfavourable impressions which some persons might be led to form of the injurious effects of factory employment.

From the crape and gauze manufactory of

complete isolation of the city from the other seats of manufacture, and its distance from any large Messrs. Grout and Co., I proceeded to that of Messrs. Willett, Neville, and Co., of Pottergate-street, who are extensive manufacturers of all kinds of fancy materials, such as Irish poplins, gros de Naples, waistcoatings, bandannas, barege and woollen shaws, "Lindianas," and various other fabrics of a similar nature. There are several Jacquard looms at work on the premises. The various processes of preparing the materials differ but little in detail from those pursued in the mill of Messrs. Grout and Co. The use of the Jacquard loom constitutes the greatest point of difference between the two establishments. The rate of wages paid to the weavers at the Jacquard looms is about 12s. per week, but they are not employed on an average more than seven months in the year. The weavers of bandannas, mousselin de laines, and other fabrics, earn about 8s. per week; but there are very few of them who are in constant employment. There were about 200 hands employed—below the usual number; this being considered the worst part of the year, the autumn goods having been done with, and the sale of the spring goods not having commenced. In the case of Messrs. Willett and Co., who have a considerable number of power-looms, the work done at this period of the year is almost exclusively spring goods, which are manufactured for stock. There were connected with the manufactory, or at work upon it, about 540 persons.

The next factory which I visited was that of Mr. Middleton, of Calvert-street, the principal articles manufactured being paramattas, bareges, and poplins. There were 100 power-looms on the premises, all of which were at work. The total number of persons employed, both on the premises and at their own homes, was about 420. When in full work they have employed as many as 800 hands. In order that I might fully satisfy myself on the subject of the wages paid to the workpeople, Mr. Middleton, in the most courteous manner, allowed me to look over his pay-book, from which I made the following selections, at random, of the amounts paid to individuals during various periods:—

PAID TO MEN.

		£	s.	d.
No. 1.	June 16 to Oct. 27	8	13	8
No. 2.	July 7 to Nov. 24	18	6	7
No. 3.	Oct. 3 to Nov. 23	1	17	10½
No. 4.	Oct. 30 to Nov. 21	2	1	9
No. 5.	Oct. 27 to Nov. 24	1	4	3½
No. 6.	Nov. 3 to Nov. 24	1	15	9

PAID TO WOMEN.

		£	s.	d.
No. 7.	Nov. 6 to Nov. 23	1	5	8

In all these cases the parties employed did the work at their own homes, and they have to pay for winding, beaming, candles, and other expenses. The amount to be deducted for these items, I was informed, was about 20 per cent. Making these deductions, we shall have, therefore, as the average earnings per week of

		s.	
No. 1.	19 weeks, at	7	per week.
No. 2.	23 ,,	13	,,

[This person, I was told, is the best weaver in the city, and can always command employment of the best kind.]

		s.	d.	
No. 3.	7 weeks, at	4	6	per week.
No. 4.	3 ,,	11	8	,,
No. 5.	4 ,,	4	9	,,
No. 6.	3 ,,	10	8	,,
No. 7.	3 ,,	6	8	,,

The carnings of some of the persons employed on the power-looms were as follows:—

		£	s.	d.
No. 1.	From March 25 to Oct. 22	12	15	0½
No. 2.	,, April 27 to Sept. 28	10	10	4½
No. 3.	,, April 14 to Oct. 30	12	7	1½

One penny per week is the whole amount of deduction to be made from the earnings of this class of weavers. That sum is charged for gas, for lighting the factory. The average earnings per week for these three persons would therefore be:—

		s.	d.	
No. 1.	30 weeks, at	5	2	per week.
No. 2.	23 ,,	8	10	,,
No. 3.	29 ,,	8	6	,,

At the manufactory of Messrs. Clabbon and Co. the principal articles manufactured are figured silks, for dresses, and "fill-over" and other shawls. The firm expect to be able to employ a large number of hands shortly upon fabrics of this kind. Mr. Clabbon informed me that he had but thirteen power looms, only one of which was at work, and that he would be glad to get rid of them all, as he found that the power-looms did not suit the weavers' work, and that their introduction into Norwich had done great injury to the trade. They had a number of Jacquard looms which had been lying idle for several years, but which he expected to set in full work very shortly; indeed, so great a demand was there for this kind of loom, that they could scarcely be purchased at any price, although a few months since they would not realize the price of old iron. The numbers then employed by the firm did not exceed 200, though when in full work they usually employed 500 hands. The average earnings of the weavers were about the same as those in the mills already referred to. Within the last few years increased employment has been given to the workpeople by the introduction of manufactures of different kinds from those previously carried on—among which may be mentioned cotton spinning, silk and satin weaving, mohair yarn spinning, and the manufacture of Leicester goods.

A large factory has recently been erected by Mr. Jay, in King-street, for spinning mohair and Alpaca yarn. The number of persons employed in, or connected with, this factory was about 250. The wool employed is of a peculiar character, and is now imported in large quantities from Constantinople. As in the case of the silk, the first process which the wool undergoes is that of sorting, according to its different degrees of fineness and coarseness. The persons employed in this portion of the work earn from 18s. to 23s. per week. The wool having been sorted, it is then sent to the combers, who work chiefly at their own homes, and who earn, when employed, from 15s. to 20s. per week. A great deal, however, depends upon the ability of the workman. The wool, when combed, is handed over to the spinners and twisters, about 100 of whom, chiefly girls, are employed in three large rooms of the factory. The rate of earnings (they are all paid by piece work) ranges from 2s. to 4s. 6d. per week. The young beginners and learners seldom get more than 2s. per week; and many of them are, I was told, "dear at that price." From the "winders and twisters," the yarn proceeds to its final stage, that of "reeling," and when completed it is made up into hanks, in which state it is exported. The persons employed as "reelers and hankers" earn from 6s. to 7s. per week. A very small proportion of this yarn is consumed in the home manufactures, the principal portion of it being exported to France. The recent convulsion in that country greatly injured the trade. So great a demand, however, is there at present for this kind of material, that Mr. Jay informed me he could employ double the number of hands if he could obtain additional "sorters;" that being considered the most particular branch of the manufacture. In France the article is used very considerably in the velvet manufactures, and for covers for sofas and ottomans, chairs, and other articles of furniture. Some portions of the finest kind are made up into ladies' bonnets, and used also in the manufacture of dresses, many of which are sold for poplins. About this time last year the earnings of the spinners did not average more than 2s. per week, owing to the great falling off in the demand for this article of manufacture.

The circumstances which led to the establishment of a cotton-spinning factory in Norwich were as follows: A few years since vast numbers of the weavers were out of employment, and in the almost constant receipt of out-door relief. Mr. Geary, one of the then guardians, suggested that some employment should be found for the able-bodied within the workhouse. The guardians, however, refused to expend any money in the purchase of machinery for the employment of the people; but after a considerable time they allowed Mr. Geary to set up some machinery at his own expense—the guardians stipulating that, as a return for this privilege, they should have the whole amount earned by the parties. Mr. Geary, however, closed with the offer, and at the end of twelve months, having expended upwards of £500, and kept a number of persons constantly at work, he asked the board to take the management into their own hands. This they refused to do, and Mr. Geary finally resolved upon carrying on the experiment at his own establishment. The machines were accordingly removed from the workhouse, and with them all the persons who had been employed upon them. From that time the trade has been steadily and constantly increasing. Having seen the thing fully established, Mr. Geary gave up that branch of the manufacture to his nephew, Mr. Sultzer, who now carries on the business. In this factory there are employed about 50 men and boys in making, polishing, and finishing the reels upon which the cotton is sold. The men earn from 12s. to 14s. per week, the boys from 8s. to 9s. About 200 girls and women are employed as winders and reelers, the best hands earning from 7s. to 8s. per week, the inferior hands from 4s. 6d. to 5s. 6d. From 50 to 100 girls of all ages are employed in the different processes of sorting, cutting, gumming on the tickets, and other multifarious duties, with wages ranging from 2s. to 6s. per week. The number of reels manufactured weekly is about 150,000. In addition to the cotton-spinning which is carried on in Mr. Sultzer's factory, about sixty or seventy persons are employed in weaving silk and satin. This branch of manufacture is carried on exclusively in Norwich by Mr. Sultzer, who was the first to introduce it. It was considered for a long time that the Norwich weavers, having been so long accustomed to other kinds of work, would not succeed in the manufacture of silk. The enterprise of Mr. Sultzer has, however, completely decided that question in favour of the weavers of Norwich—having already wove some satins which have been considered fully equal to the best made in Spitalfields. The earnings of the weavers in this case, as in all others where they are paid by the piece, depend greatly upon the ability and skill of the individual. While at Mr. Sultzer's mill, a weaver brought home a piece of satin upon which he had been occupied four weeks and two days. The amount which he received for his work was £2 16s., being at the rate of 14s. per week. Deducting the expenses of winding, candles, and other things, his wages would average about 11s. or 12s. The total number of hands employed was between 500 and 600.

There is no manufacturer in Norwich who exerts himself more laudably for the promotion of the comforts of his workpeople than Mr. Sultzer. He has recently built several comfortable cottages in the neighbourhood of the factory for the accommodation of the persons employed by him, and he is now erecting warm baths for the use not only of his own workpeople but for the public generally. In the whole of Norwich there is no such thing as a public bath, and it is intended to give a warm bath and a clean towel to every person for one penny. Mr. Jay means also to form a bath for his workpeople. In both cases it is intended to keep up a constant supply of warm water from the engine connected with the factory. No person known to be of a bad or immoral character is allowed to continue at work at Mr. Sultzer's factory, and provident habits are encouraged, as far as they can be, among the workpeople, by the formation of coal clubs and provident societies. Upon the payment of a small sum per week to the coal club, a quantity of coals is sent in at cost price to the subscribers at the cheapest time of the year. The object sought to be gained by the provident society or club is that of inducing the workpeople who can spare it to deposit a portion of their earnings with their employer, who invests it in separate accounts, and in the names of the individual depositors, in the savings bank. Mr. Sultzer informed me that he had known great benefit to be derived from this system, as the workpeople were enabled to lay by a few shillings, without the risk of its being discovered by their more improvident relatives, who would be certain to obtain it from them when they felt they wanted any little assistance.

At Mr. Geary's factory about 520 persons, of both sexes and all ages, were employed at the time of my visit. The articles manufactured here are—netted shawls, braces, webbing for shoes, belts, and a variety of miscellaneous articles of that character. Connected with the brace department there were 109 girls, mostly very young, employed in preparing the brace ends, sewing on the buckle, and making the button-hole. There were 49 of them who were "seamers," 34 "button-hole workers," who were at work on the premises, and 26 who worked at their own homes. I inquired of the children—for the great majority of them appeared to be from ten to twelve years old—how much they could earn in the week? One said she could make four gross in a week, which was 3s.; two others could make the same quantity; one made three gross and a half, which was 2s. 7½d.; two others made three gross, equal to 2s. 3d.; while several of the newer hands could not make more than two gross, and some not so many as that. Mr. Geary informed me that he was anxious to avoid employing the children when too young, but he was constantly pressed by their parents to take the children and give them work. Many of them had been brought to him to employ when they were scarcely fit to be left without a nurse. I was surprised to see, among the little children, some girls who were considerable older, and some even young women; and upon inquiring as to the cause of their being so employed, they informed me that they liked the work much better than anything else, although they could not perhaps earn so much at it as they could at other work; still it was regular, and for that reason they preferred it. All the work in this department was of course done by hand with the common needle. The whole of the children appeared to be perfectly contented, and to all appearance were in excellent health and spirits. In another portion of the building are to be found upwards of one hundred boys, who are employed in making shoes and slippers. The usual mode adopted in the city is to teach the boy the business in four years, upon payment of £5 as premium—the boy receiving a shilling a week for the first year, two for the second, three for the third, and four for the last year. The plan pursued by Mr. Geary is to take the boys, without any premium, for four years, teach them their business, and pay them for whatever amount of work they may perform. The boys are regularly indentured, and undertake to remain four years; Mr. Geary undertaking, on his part, to teach them the trade, and to find them employment during that period. At the expiration of the term they are at full liberty to stay with their employer, or seek employment elsewhere. The boys are all kept in constant work, and during the first year many of them earn from 3s. to 4s. per week, while the best and oldest hands earn from 12s. to 14s. In the rooms in which the netting belts and webbing were wove there were 50 power looms, and about 60 persons employed, whose average earnings were from 5s. to 6s. each per week. There is an evening school for adults in connection with this factory, which is under the management and care of Mr. Geary. There is also a tolerably large school in connection with the factory of Mr. Sultzer.

In addition to the factories already referred to, and which I have personally visited, there are various others. There is a large establishment conducted by Messrs. Toler and Co., who are principally shawl, paramatta, and fancy dress weavers. This firm manufactures more of the kind of shawls called "fill-overs," many of which fetch a very high price, than any other manufacturer in the city. The number of hands employed by them in all branches, including hand and power-loom weavers, is probably from three to four hundred. About three hundred persons are employed at the Lakenham factory, conducted by R. W. Blake, Esq., in spinning mohair, in the same manner as at Mr. Jay's factory. At the Yarn Company's works, at St. Edmund's, there are about 400 persons employed in spinning yarn for the weavers, to manufacture into Orleans cloth, paramattas, challis, and various other fabrics. Messrs. Bolingbroke and Co. also manufacture considerable quantities of woollen and fancy goods of various descriptions. They have a number of hand-looms on the premises, for weaving paramattas and other fabrics, which are almost constantly at work. The whole of their fabrics are manufactured by hand, it being the only firm in the town which does not use steam power. I was not able to learn the exact number of hands employed, but was informed that the numbers ranged from 200 to 300. A large factory has recently been built, called the St. James's Power Loom Factory, which was built by a company of shareholders, and the various manufacturers occupy portions of the building, paying rent to the proprietors for the use of the looms and the power.

The whole of the factories which I visited were remarkably clean, the floors of nearly all of them being cleansed once in every week. There was an air of comfort and cleanliness about the whole of them that contrasted strangely with the wretched habitations of some of the handloom weavers whom I subsequently visited. There are none of the mills which work more than ten hours, and in none of them is the relay system adopted.

Before proceeding to give an account of the condition of the working-classes of Norwich, it will be as well perhaps if I endeavour to give the reader some faint idea of what may be termed the sanitary condition of the city itself. Norwich is built upon the river Wensum, which, at a short distance from the city, forms a junction with the Yare, by means of which a direct communication is afforded with the sea, at Yarmouth. The site is composed of a light soil upon a substratum of chalk, gravel, and sand; and being for the most part built upon rising ground, the city possesses a considerable amount of natural drainage. Its extent is about a mile and a half in length from north to south, and about a mile and a quarter in breadth from east to west. The city was formerly surrounded by walls, great portions of which still remain, though in a very ruinous condition. In some of the best localities a considerable portion of the ground is laid out in small gardens attached to the houses; but in the parts occupied by the working classes the houses are densely built. The streets in those parts are built without the slightest pretension to anything like regularity or plan, and it is next to impossible for a person not born in the place to find his way about without the assistance of a guide. Indeed, many of the inhabitants of the city are themselves perfectly bewildered in the endless labyrinths of streets and lanes which beset the adventurer on every hand. The great majority of the streets are so narrow that there is not room for vehicles to pass each other, and the greatest possible annoyance is constantly felt by persons who may be desirous of making anything like progress in these narrow and tortuous districts. Many of the streets, even in the better portions of the city, are wretchedly paved; and persons who, like myself, may have been employed for hours together in walking over what by courtesy is called the pavement, may probably be enabled to form some faint notion as to the penance endured by some of our ancestors. In addition to their being badly paved, the streets are also miserably lighted. In fact, the place appears to have been constructed with the view of affording as much inconvenience as possible to the unfortunate pedestrian, who, by duty or inclination, may be led to perambulate its thoroughfares.

As regards those portions of the city and the suburbs where the working classes chiefly reside, the poverty, wretchedness, and vice of the inhabitants, added to the decaying state of the houses, bear witness to the comparatively prostrate state of the manufactures of the town. The houses inhabited by the working classes are generally in the most dilapidated condition. Within the boundaries of the city you must search for the working classes in narrow lanes, courts, and yards, the entrance to which from the adjoining thoroughfares is through low and narrow openings or archways. Here will be found rows of wretched cottages, built in most cases back to back, ventilation being almost entirely excluded. Where the cottages face each other, in many cases they are not more than three feet apart. Down the centre of these places an open kennel or drain—perhaps not even that—carries off the refuse water, either into the adjoining streets, or into some receptacle, where it is allowed to soak away into the surrounding soil. Great numbers of the houses, both within and without the city, are situated in yards and alleys below the level of the adjoining streets. These places are appropriately named "holes," such as "Dyble's Hole," and others. Many of these "holes" are to be found in the lower parts of the city, abutting on the river, where the ground is constantly damp and moist; while heaps of filth and rubbish, open binns or privies, decaying vegetable and other matters, are constantly contaminating, by their offensive malaria, the unwholesome atmosphere in which the wretched inmates live. During the recent visit of the cholera the authorities aroused themselves to a sense of their dangerous position, and everything was done which wisdom could dictate. Many of the places which for years before had never known cleanliness received a coat of whitewash for the first time; gutters and drains were laid down along the surface, large quantities of lime were distributed in all parts of the city, the receptacles of filth were emptied and cleansed, and many of the chief nuisances were removed. These well-timed exertions were so far successful that not more than forty persons died of cholera; but of this number nearly the whole were inhabitants of the worst parts of the city, such as may be found in the neighbourhood of Lower Westwick-street, St. Swithin's; King-street, St. Julian's; and Cowgate-street, St. James's. I was informed that there are not more than 3,000 houses out of the whole number in the city that are supplied with water, the remainder having to obtain their supplies either from the river, into which all the filth of the city flows, or from cocks belonging to the water company, where the water is laid on for a few hours each day. Many of the houses are over-crowded to an enormous extent, and in several instances I have seen two or three families living together in houses barely sufficient for one family. There are no public baths or washhouses, nor any public parks or places set apart for recreation.

It is not easy to ascertain with anything like precision the number of persons employed as weavers in Norwich. In the year 1838 an inquiry was instituted by the Government into the condition of the hand-loom weavers of Norwich; and upon that occasion it was found that 5,075 was the total number, employed and unemployed. Since that period, however, considerable changes have taken place in the trade of the city, and the number of hand-loom weavers has considerably diminished. According to the census of 1841, there were in Norwich 2,344 weavers, 121 persons engaged in cotton manufactures, 106 persons returned as factory workers; shawl makers, 62; silk manufacture (all branches), 1,277; woollen and cloth manufacturers, 394; worsted and yarn, 253; gauze and stuff weavers and spinners, 83; making a total of about 4,650 persons employed in the silk and woollen manufactures of the city. The more recent introduction of the power loom, since 1841, has, however, again affected the distribution of the various workers. The inquiries which I have been led to make upon the subject of the number of persons employed in connection with the manufactures of Norwich, have led me to the conclusion that the present number of hand-loom weavers is about 2,500; weavers employed in the power-looms, 750; making a total number of weavers of about 3,250. The numbers employed in the yarn, mohair, and worsted manufactures do not exceed 1,000 of both sexes and all ages; about 1,200 persons, chiefly children, are employed as winders; and the number of warpers, pickers, sowers, dyers, packers, hot-pressers, havel makers and drawers, slaie and shuttle makers, &c., may be set down at about 500—making together a total of 5,950 persons employed in the different branches of manufacture connected with the city. Deducting from this number the 1,200 winders, who are for the most part children, we shall have 4,750 persons, of whom it will not be too much to suppose that two-thirds, or 3,100, are married people with three children. There would then be a portion of the population of Norwich, amounting to 14,050 persons, who were either engaged in or dependent upon manufactures for their subsistence.

I was anxious to ascertain as correctly as possible the earnings of the weavers, both at their own homes and in the factories; and for this purpose I visited numbers of the hand-loom weavers at their own homes, and obtained from their own mouths statements of the amount of their earnings and their mode of life. In my next I shall give the reader the information which I have thus collected upon the subject.

THE AGRICULTURAL DISTRICTS OF ENGLAND.

FROM THE TIMES' COMMISSIONERS.

King's Lynn, Norfolk, April, 1850.

The improvement of agriculture in West Norfolk is inseparably connected with the name of Mr. Coke, of Holkham, afterwards Earl of Leicester. Lord Leicester came into possession of his estate in 1776. By changing the mode of farming then adopted, which was to crop as long as the land would bear anything without outlay, into a system by which stock was kept more extensively and a more equal proportion observed between corn and stock, these light lands were at length brought to produce wheat, for which they had formerly been deemed unfit. To give firmness to the light surface soil of the district it was top-dressed with clay marl, a stratum of which was fortunately found to exist at various depths beneath the surface throughout nearly the whole district. Rape-cake was also tried as a top-dressing, and found successful. Clover and artificial grasses were introduced, and with the increased means of keeping them an improved stock of cattle and sheep were maintained. Both that he might obtain information himself and diffuse it among others, Lord Leicester established an annual meeting at Holkham, where practical men from the surrounding country, and afterwards from distant counties, were invited to attend, freely to criticise what they saw, and then to discuss such matters of practical interest as bore upon their own business. The four-course, or Norfolk system of cultivation, was then introduced, and Lord Leicester's aim being to get his estate into the hands of farmers of skill and capital, he erected on his different farms such buildings, and gave otherwise such advantageous conditions, as brought to him men of the highest class in their profession. The wisdom of this course is now shown in the continued progress of improvement, for here there is no standing still, no belief that perfection in farming has been attained, though, as will be subsequently seen, probably few farmers in England have more right to be content with the point they have reached than the best of Lord Leceister's tenants. And ample though the expenditure in the erection of farm buildings was, as mentioned in our last letter, the accommodation for stock is now far from sufficient, and the outlay on the estate for last year by the present earl, in repairs and additions, was not much under £10,000.

To convey an idea of the present state of farming in West Norfolk, where it is carried out in the best style, we shall give a brief outline of such as we had an opportunity of examining. The farm of Mr. Hudson, of Castleacre, is between 1,400 and 1,500 acres in extent, held in two adjoining occupations of nearly equal size. About 1,200 acres are regularly under crop, and somewhat over 200 acres in pasture. The four-course rotation is followed throughout, there being annually 300 acres in wheat, 300 acres in barley, 300 acres in turnips, &c., and 300 acres in clover, and trefoil and white clover alternately. No rye grass is sown with the clovers; as, being a cereal, it is considered injurious to the following wheat crop. The principle adopted here is to manure for *every* crop. Thus, for the wheat eight three-horse loads of dung are laid upon the clover after it is mown. This promotes a rapid growth of clover, which is ploughed in for the wheat crop. Salt is sown over it in spring to strengthen the straw. Turnips are manured partly with dung, and partly with artificial manures, 25s. an acre being expended for this purpose in guauo and Lawes's superphosphate. A large proportion of the turnips are consumed on the ground by sheep, which are also cake-fed, and the soil is thus prepared for barley. The land is covered with clay marl once in a lease of 21 years. In the feeding of stock 10 tons a-week of oil-cake are consumed during the winter, in addition to the green crops and herbage of the farm, Mr. Hudson never using less than 200 tons of cake in a year, and sometimes considerably more. Each bullock gets 10lb. of cake a-day, besides roots, and each fatting sheep on an average ¾lb., beginning with ½lb. and ending with 1lb. daily. The cattle are fed in open courts with sheds, well littered with straw. 36 work horses and 16 working bullocks are required for the operations of the farm. The bullocks work in pairs, two in a plough, the same as the horses, and walk quite as quickly, and in either plough or harrow, get over as much ground as the horses. Each ploughman drives his own pair. The farm horses are fed on sprouted barley, 12lb. each daily, besides fodder. The barley is steeped 24 hours, then placed in a heap on a floor, where it is turned once a-day for five days, by which time it is ready for use. A new heap is steeped daily, and one consumed, the first being laid at one end of the house, and, being daily turned, arrives in due course at the other end, where it is taken out. With this feeding, on this light land, where the furrow seldom reaches six inches in depth, the horses are maintained in good healthy condition. A small dairy of Devon cows is kept, the produce of which is reared and fed. The ewe flock is Southdown, the fat hoggets now going off to the London market. The sheep are at present being fed on rye, sown after wheat for spring feed, and now affording a full bite. Mr. Hudson does not sow tares, as he considers the tare very exhausting to the land. The whole harvest work of the farm is done by 32 mowers, each of whom is attended by one woman to gather, and one to bind up the sheaf. In carrying the crop the stacks are always made in the field where they grew, and carted home to the barn as required during winter and spring. The only kind of wheat sown is Spalding's Red, which is found by much the most prolific hitherto tried in West Norfolk. Twenty-seven years ago the stock annually kept on this farm was 400 sheep and 30 bullocks; it now averages 2,500 sheep, and 150 bullocks. The wheat and barley crops then did not exceed 22½ bushels an acre; that average is now nearly doubled. Every crop is drilled and the land kept perfectly clean. The roads and fences are all maintained in the best order, and the beauty and regularity of all the crops now growing on the farm sufficiently attest the enterprise and skill of the farmer.

As exemplifying the saving of waste in the transportation of fat stock to the London market by the introduction of railways, Mr. Hudson mentioned to us a fact which may be interesting. Formerly when several days were occupied in driving to London, a sheep was found on the average to have lost 7lb. weight and 3lb. inside fat, and a bullock 28lb. These weights were ascertained by a series of trials, average animals being killed and weighed on the farm and compared with the weights of similar animals when slaughtered in London. This difference of weight was waste, entirely lost to everybody. On the quantity of stock annually sent out by Mr. Hudson this loss was equivalent in value to upwards of £600 a-year, nearly the whole amount of which now finds its way to the market, as the stock are put into the trucks in the morning and reach London in the afternoon without fatigue. When it is considered over how great a quantity of stock throughout the country a similar saving has been effected, there can be no doubt that the increased weight so saved has had a perceptible influence in the general supply of the market.

A few miles further north lies the farm of Mr. H. Overman, at Weasenham. It is managed generally like other well cultivated farms in the district, but is peculiar in having on it a stock of Ayrshire dairy cows, the produce of which, in butter, is sent to the London market. During the winter the cows are fed on swedes and a little hay, and those which are giving milk receive also three pounds of oilcake daily, till the grass is forward enough for turning them out to pasture. Mangold wurzel is not given to the cows, as, though productive of milk, it is not found to yield butter. The taste of the turnips is taken from the butter by scalding the cream in a pan placed in a boiler of hot water, and when the cream is hot, saltpetre (at the rate of half an ounce to a gallon of cream) is dissolved in it, which is found completely to neutralize the peculiar taste of the turnip. Excellent butter is made by this management and feeding.

Holkham-park, the seat of Lord Leicester, is situated within a mile or two of the sea, on the north coast of the county. The home farm, which is managed by Mr. Keary is within the park, and extends to 1,800 acres, 1,300 of which are under tillage and 500 in pasture. The farm buildings are in three different situations, for the convenience of carting in the corn and carting out the manure. They are commodious and well arranged for the object in view—viz., the storing in large barns of a considerable portion of the crop, and the accommodation in yards and sheds of cattle, littered with abundance of straw. A herd of pure Devons are kept on the farm, many of which are very fine specimens of the breed. Their aptitude to fatten on a somewhat scant supply of food is very remarkable. A stock of 40 cows is kept, and their produce reared and fattened. They do not yield much milk, but it is of rich quality. The usual stock of cattle on the farm is 250 head, inclusive of 20 working bullocks. The sheep stock numbers about 2,500—700 of which are pure Southdown ewes. About 150 pigs are also kept—a cross between the Neapolitan and the Suffolk, combining the fineness of flesh and fattening properties of the former, with the hardiness of constitution and fecundity of the latter. 32 farm horses and 20 working bullocks are the working stock of the farm, the bullocks working in pairs, but changed at each yoking, a fresh pair being taken in the afternoon; four bullocks thus do the work of two horses in either plough or harrow. The farm is cultivated in the usual four-course rotation. Mangold wurzel, of which the red globe variety is preferred, is cultivated on 27-inch ridges, in which 10 3-horse loads of dung and 20s. worth of artificial manure per acre have been deposited. For swedes seven to eight loads of dung and 15s. worth of artificial manure are applied. White turnips are sown on the flat in rows 18 inches apart, 30s. worth of artificial manure being drilled in beneath them. The manures chiefly used are guano, and Lawes's superphosphate. In the other operations of the course the usual details of good farming are practised. The whole of the young wheats, 280 acres in extent, have a top-dressing applied to them in spring of 6 stone of nitrate of soda mixed with 16 stone of salt to the acre. This quantity is applied in equal moieties at intervals of three weeks or a month, beginning early in March and ending about the 20th of April. It has been found in practice better to apply it so than to lay it all on at once. The cost at present is 15s. an acre; and the increase of crop not less than six bushels an acre. Spalding's red wheat is the only variety sown. The rent charged against the farm is 20s. an acre, the expenditure in artificial manures and food is as much more, and the labour amounts to 32s. an acre on the land under tillage. Labourers are paid 9s. a-week, but earn with task work 10s. 6d.

At Mr. Overman's, of Burnham Sutton, another of Lord Leicester's tenants, the same system of high cultivation has been long successfully followed. In top-dressing his wheat Mr. Overman uses 1 cwt. nitrate of soda mixed with 2 cwt. of common salt, applied in two dressings, as already described. He has long given up horse or hand hoeing his wheat crops in spring, from the conviction, founded on experience, that it is injurious on light lands by increasing the proportion of tail or inferior wheat. This opinion we find is common among the best light-land farmers, and hoeing the wheat crop is nearly discontinued in this part of the county. We were sorry that we had not an opportunity of visiting Mr. Bloomfield, of Wareham, and others of Lord Leicester's tenants, equally noted for the excellence of their farming.

The question of how far the four-course system of husbandry continues applicable to the present circumstances of agriculture we heard frequently discussed by the most intelligent and experienced farmers in West Norfolk. We found but one opinion on the point, and that was, that covenants were necessary to bind bad farmers, not good ones, and that with our facilities for obtaining artificial manures and food a strict adherence to the four-course system was no longer either necessary or expedient. Accordingly in every case we met with where a man farmed his own property, or was not restricted by rigorous covenants, the four-course was departed from. On this point we were favoured with some valuable information by Mr. Blyth, of Sussex Farm, Burnham, whose style of cultivation and the high condition of whose land may challenge comparison with any in the county. For a number of years back he has been growing more and more wheat, diminishing his barley, and taking an additional corn crop in the course. His system now is as follows: (1) Clover, trefoil, or peas, (2) wheat, (3) oats, (4) turnips, (5) wheat or barley. He manures for every crop where he thinks it requires it. On land where the turnips are fed off before Christmas the crop of barley was never found so good by six or eight bushels an acre as on that which is fed off later, and on that portion he always sows wheat. To show the gradually increasing produce which follows a constantly improving system of agriculture, we give the following figures from the farm books of an equally competent authority:

		Bushels an acre.
The average wheat crop for 7 yrs. ending	1839	25
Ditto ditto	1846	29
Ditto for 2 yrs.	1848	36
The average oat crop for 7 yrs. ending	1839	54
Ditto ditto	1846	57
Ditto for 2 yrs.	1848	68
The average barley crop for 7 yrs. ending	1839	31
Ditto ditto	1846	33
Ditto for 3 yrs.	1849	45

It will be observed that in each case the increase of average has been greatest since 1846, and this may be in part accounted for by the use of artificial manures, as a direct application to every crop, having since that year become matter of system, and also from the very rapid strides which our agriculture has made within the last four years in the hands of all who had the means, and who were not hampered by unwise restrictions from following the obvious course of improvement. It is further important to find that these increasing averages of wheat crops have taken place simultaneously with more frequent calls on the land, there having been on this farm for the first period of seven years an annual average of 214 acres in wheat; for the second seven years 268 acres in wheat; for the last two years 340 acres in wheat.

On Sussex Farm Mr. Blyth follows the same system of top-dressing his wheat with nitrate of soda and salt, as has been already described. He does not hand or horse hoe his wheat crops in spring, but carefully rolls them, having found by frequent experiments that where rolling is omitted, there will be a large deficiency in harvest. He breeds and fattens his own stock of cattle, and keeps a large flock of Southdown ewes, crossed with the Hampshire down, which produces a much more profitable sheep than the pure Southdown, but not one suitable for prize gaining. Twenty-five lambs to the score is the average yield, though that is frequently exceeded. Millers' offal is given to the lambs along with their green food. During winter they receive daily ¾lb. to 1lb. each of oats and peas crushed, while feeding on turnips, and are now being sent off fat to London out of the wool at 27s. to 28s. each. The wool is worth 7s. more. On account of the low price of corn Mr. Blyth has been using it exclusively in the feeding of his stock this season. Chicory is grown on a large scale on this farm, there having been 50 acres under this crop last year. It is taken after wheat instead of an oat crop, drilled in May with artificial manure, and treated exactly like carrots. It is taken up in autumn, in quantities as it can be manufactured; for it is not injured by frost, and receives no damage by being left in the ground. After being washed, the roots are cut with a small guillotine machine, and then kiln-dried—12 to 15 tons, the produce of an acre, drying to about one ton; in which state it is sent to London. The price this year has ranged from £15 to £23 a ton. Last year it was not more than £10, and did not pay, as the manual labour in the cultivation of the crop, and the expense of drying, &c., amount to £5 a ton. At the present price it pays well.

The average number of labourers employed at present on a light-land farm of 1,000 acres has been ascertained, by comparison of 10 different farms in West Norfolk, to be—

Men able to do harvest work	Men of inferior ability.	Lads above 16 years.	Boys under 16 years.	Women.
28.1	4.5	7.8	11	6.25

The wages of labourers in Norfolk are at present 8s. a-week, in some places a reduction to 7s. is spoken of. A great proportion of the work on farms, however, is done by task work or contract, and the rate of wages, therefore, does not afford any correct estimate of the condition of the peasantry. Task work will generally bring larger pay to the labourer, but this is more doubtful where the farmer resorts to contract. Hand hoeing and other light operations of husbandry which can be carried on by children are sometimes paid for in this last mentioned way, a man engaging to do what is required for so much, and employing all the children he can collect in gangs to get through with it. The evils of such a state of things are obvious. The boys and girls, thus brought together from considerable distances, frequently do not return home at night, and sleep in stackyards or barns or wherever they can find shelter. Another point connected with farm labour in Norfolk is the employment of women in the fields—a practice which does not exist in some counties, and which some of the most intelligent agriculturists here strongly condemn. They contend that it has a most demoralizing effect, causing women thus employed to lose all feeling of self-respect, rendering them bad housewives when married, and unfit, from want of experience, to exercise that strict economy in expenditure and to provide those small fireside comforts which are so necessary in a labourer's wife. It is further said to be very questionable whether, even with the low wages paid to them, they are employed remuneratively to the farmer, as they are generally slow and indifferent workers. These objections relate to the regular employment of women in field labour, not to their assistance in harvest time. Another point brought before our notice with reference to this part of our inquiry was the importance of improving the industrial habits of the labourer, of making him more expert at his work, more steady in his conduct, and a better and more useful member of society than he hitherto has been. For this purpose an association has been formed in the union of Docking, which distributes prizes annually to successful competitors in ploughing, stacking, mowing, and other operations of husbandry. Prizes are also awarded for good conduct, for knitting done by the labourer's wife and children, and for various other things calculated to stimulate the mind of the peasant and add to his humble comforts. In this way the association alluded to distributes annually £120 in prizes, and we were informed that, though only a short time in existence, beneficial results are already observable from it. The prizes are keenly contested, and it is not an uncommon thing to see 50 ploughmen and 30 mowers contending for supremacy. The association is limited to the union in which it exists; but so much good has been effected by it, that similar societies are springing up in other parts of the county. Another mode in which the intelligent practical men with whom we conversed on this subject in Norfolk provide for the welfare of those they employ, is by insisting that they shall become members of the benefit club for their several districts. An attempt was made some time ago at Burnham to associate the farmers and principal people of the locality with the labourers in the formation of a benefit club, for the support of the latter in sickness and to defray their funeral expenses when they die. The plan, however, failed, the labourers themselves refusing to co-operate in such an object. There appears to be a very strong conviction felt by many farmers in Norfolk, that the law of settlement has pressed most injuriously upon the energies of the labouring classes, and that its removal will be followed by the best effects. We met with once case—that of the Docking Union—where by private arrangement this result had already been secured; the question of settlement having been extended to the whole union, and a complete termination put thereby to those heartburnings and disputes between parishes, and those endless difficulties which previously existed. The labour of this union was fully employed; wages were from 8s. to 9s. a-week. Great attention was given to the means for raising the social condition of the peasantry, and especially it was found that the listless indifference superinduced by the feeling that, however a man works, his parish must support him, was being overcome.

AGRICULTURE AND THE RURAL POPULATION ABROAD.

[FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.]

FRANCE.—No. IV.

The Valley of the Loire.

The traveller who strikes the winding course of the Loire at Orleans, and prepares to follow its downward track by almost the only means now left available—the railway to Tours—will be apt, when he starts, to look wistfully on either side of the carriage for the boundary of hills engirdling the valley along which he is being conveyed. For many a league he will look in vain. If he have previously traversed the corn plain of the Beauce, he will be ready to imagine, even after he has left the rich towers of Orleans Cathedral behind him, that he is still being whirled forward on a continuation of the same great platform of rich soil, the principal difference being the substitution of endless vineyards for boundless corn-fields. As the train proceeds, however—as it leaves upon the left the church of Notre Dame de Clery (what reader of "Quentin Durward" but remembers Louis XI. on his knees before his leaden statuette of its image of the Madonna?)—as the comfortable and well-appointed train glides smoothly on its course—slowly-flowing streams begin to wind through the vines, making their stealthy way to the river on the left; patches of fresh green meadow land begin to stretch along their banks; and wood and coppice and avenue, shorn of their fair proportions upon the dry upland level sacred to the growth of wheat, begin here again, in the lower and moister soil, to regain all their richness of sap and mellow luxuriance of growth. Still the country appears to the eye nearly a dead flat; and the languid old town of Beaugency is gained before gently swelling undulations upon the right begin to heave the vineyards up in long sunny slopes, stretching skyward from the railway.

At the foot of these little vine-hills, and bordering the Loire, clustered round a wan square old tower of the tenth or eleventh century, lie the narrow streets of the aforesaid Beaugency; and there, for the time being, I took up my quarters. Hereabouts a very characteristic view of the river is obtained. "For the greater part of its immense course," says old Arthur Young, "the Loire exhibits a stream of sand, and rolls shingles through the valley instead of water." The Loire, except when in terrible flood, does not fill above a fourth or fifth of its ample bed—the long straggling bridges which cross it, for the most part spanning huge brown banks of sand, or long streaks and ridges of shingle. Such a bridge—and a curious one in other respects—bestrides the Loire at Beaugency. It was begun in the fifteenth century, and does not appear to be quite finished yet. Of course all possible forms of pontal architecture are comprised in this old and new erection. In crossing from Beaugency you first pass a couple of common-place modern arches; then you find yourself for about twenty paces on a suspension bridge; next comes a continuation of stone of a different breadth of roadway, with arches—some of them round, some of them peaked, like mixed Saxon and Norman architecture; and then, by way of finishing off, you find yourself upon a piece of crazy woodwork, with a plain view of the sand and water beneath, through the interstices of the shrunken and splintered timber. Altogether, it is a structure the greater part of which has undoubtedly weathered many a flood, but which, nevertheless, you would have serious qualms about crossing in a heavy diligence. From its centre, however, you obtain the characteristic view of which I have spoken, of the Loire as it appears in the upper portion of its course. Fancy a long brown sand-bed, interspersed with rapid shallow streams, dotted here and there with clear isolated pools, and veined with canal-like strips of slowly-moving water. Now and then, indeed, the different channels merge into one, and a clear swift stream flows rapidly over its bed of shining pebbles, bending branches of trees stuck hither and thither buoying the deepest channel for the benefit of the bargemen; but the dusky sand-banks soon upheave their banks again, the ridges of grey shingle again re-appear, and the river splits and sub-divides itself as before. Frame this aquatic picture in banks of quiet green pasture—diversify them with groves of willow trees, rows of poplars, and jungles of low-lying bushes, banked in on the right by bright vine slopes—and you have a fair picture of the Loire as it flows through that upper portion of its valley called L'Orleannois.

On the left hand for about three miles inland runs a strip of corn and pasture land. I rambled through it from side to side. The soil was light, but rich and fertile, and in proportion to its capabilities was the inefficiency of the culture. The meadows produced uneven crops of rank grass, weeds largely mingling in the patches where the blades of the legitimate herbage grew the longest and the freshest. In several potato fields which I passed the vegetable was fighting a vigorous battle with all sorts of interloping weeds, and it was hard to say whether the honest *pommes de terre* or their enemies had the best of it. As I went southward the ploughing appeared to become less and less efficient. The furrows in the fields of the Orleannois are certainly not more, if so much, upon the average, than four inches deep. Fallow, manured—rye, oats, potatoes, wheat, and haricots or peas—I ascertained to be an ordinary course of cropping in the practice of the farmers hereabouts. Patches of hemp abound. The crop is, I believe, reckoned by English agriculturists a scourging one. The French farmers hold that it cleans the land well after white crops, and they frequently plant it after wheat or barley, particularly in low-lying patches of moist soil, sheltered if possible by wood. The general style of the farm buildings hereabouts differs from those of the Beauce. You lose the quadrangular form, and the space occupied by the farm steading is less extensive. The larger establishments generally consist of the dwelling house, the barns, cattle places, and cart sheds built in a line, the litter and dunghills arranged in front, and the clumsily-built stacks in the rear. Some of the farm buildings are entirely girdled by a species of verandah, reared upon roughly-hewn wooden pillars, and surmounted by a wattled roof, underneath which are stored piles of faggots and brushwood. Here and there you have a modern-looking farm building; but the great majority are wan and time-worn structures, bulwarked by strange old buttresses, and encrusted with all sorts of irregular additions and masonic vagaries, stuck upon roof and gable; quaint old places, under the eaves of which Goldsmith may have played the flute when wandering on his scatter-brained journey by the " murmuring Loire."

The village of Suilly, about four miles upon the left or south bank of the river, seems a fair specimen of the larger class of hamlet of the country. With here and there an exception, it is composed of one-storied cottages, their whitewashed walls clustered with vines. In the majority of instances, each family appeared to live in one low, irregularly built, but generally pretty large room, stone or brick paved, and often unpleasantly dark. The usual furniture of the French cottage—good beds and handsome old chests of drawers, dark with age—was generally to be seen, while a fair assortment of stewing pans was usually arranged round the fire-place. When a second room occurred, it very frequently appeared to be a sort of half barn, half sleeping place—" shake-downs " being deposited in corners among the still untied sheaves of wheat and barley. Adjoining such houses, the habitations of the better class of small proprietors were usually wattled sheds, lightly built of fir cuttings, and affording a *quasi* shelter for the cart and plough. The hemp grown about the district is manufactured in such villages as these into ropes, which are used principally as halters for cattle, and into the sacking in which the corn is stored. During the winter months, spinning hempen thread is the principal female occupation. The women make at this sort of work from five to eight sous a day, and the manufacture of the primeval machinery employed, the antique spinning-wheel, is still a regular branch of industry pursued by all workers in wood in the vicinity. It seemed odd to see spick-and-span new assortments of these old-world implements standing undauntedly at the makers' doors and windows. With " all new additions and improvements " they sell at five francs each.

At the weekly Saturday market which I witnessed at Beaugency there were two things which struck me as novel. In one department of the fair among great quantities of coarsely made male and female clothing, there were exposed for sale vast stocks of rags and remnants intended for patching. These were all either washed or brushed perfectly clean, and made up in bundles of cloth, cotton, linen, and so forth. Here you might find a piece to match almost any textile fabric or varied pattern you possessed. Every shade of the blouse-cloth, every stripe and every figure affected by rustic coquettes for their adornment, had its fragmentary counterpart. And there was nothing to be seen, be it remarked, of the fusty filth of our own Rag-fair. Clean tatters are not common things, but here they were in abundance; and, considering their destined purpose, the whole exhibition carried about it a praiseworthy feeling of thrift and common sense. The people hereabouts are hardly so well shod as their northern neighbours. The sabot is commonly worn without stockings—the foot, however, being sometimes defended by a sort of cloth sock, frequently made up from different coloured patches. Here and there upon a country cross-road you fall in with a woman evidently impressed with the truth of the celebrated Scotch observation, that worn skin grows again, but worn shoes don't, and accordingly carrying her *chaussure* in her hand; whilst once or twice I have encountered a still more economical genius trudging barefoot to his work, and bearing aloft his sabots on the point of a pitchfork.

The second phenomenon of the Beaugency fair was the appearance of a character who in England has long since faded from amongst us, and who, even upon the Continent, is rapidly becoming a more and more rarely seen apparition. This was no less than a travelling quack doctor, dispensing his medicines and haranguing his patients from an open cabriolet placed in the centre of the busy market place.

Journeying on from Beaugency, down the Loire, the traveller finds the characteristics of the country and of the people altering in but a slight degree. On the whole, perhaps, as he proceeds to the south-west, he will see more and more slovenliness of general cultivation—always excepting that of the vineyards, which are tended with the most anxious care; and he will also note some degree of falling off in the style of garments of the peasantry. In the environs of Blois, for example, I found the country labouring people very commonly pursuing their avocations barefoot; this was especially the case with the women. The luxuriant fertility of the flat soil which hereabouts borders the left bank of the Loire is very striking. The country is laid out in vineyards, every individual plant in which—the weather being dry and hot—I found undergoing a careful daily watering, the green expanse of the vines being specked here and there with patches of corn, potatoes, melon beds all yellow with the big luscious fruit, and numbers of unenclosed kitchen gardens destined to supply Blois with vegetables. The aspect of these varied crops was rich to rankness. Alternating with each other in tiny patches, the ground was chequered like a gaudy tartan with their hues, and the air was cloyingly sweet with the odour of fruits and flowers. Thickly scattered in this vast garden were the cottages and adjoining farm-buildings of the small proprietors. With here and there an exception, nothing could be more slatternly and utterly inadequate to all the purposes of dwellings and farm-steadings than these ill-contrived and worse managed structures. The filth was repulsive. Beside the dung-hill, and before the door, was usually a green cesspool of liquid manure. Passing to leeward, you perceived the prevailing scent of the melon beds, varied by a trail of dismal stenches from each of these foul laboratories. The out-houses were frequently built after this fashion :—a double set of thin straggling stakes are stuck in the ground, and between them are piled up, in the manner of a wall, loosely-bound sheaves of straw, fortified, in some cases, by a meagre wattle-work of fir cuttings or broom. Of course the sheds so formed are neither wind nor water tight. A stiff gale drives them down before it like houses of cards; but the materials are none the worse, and a few hours' labour suffices to pile them up again. When structures of a more substantial character are reared, there is abundant evidence of an utter want of design and coherency in their parts. Even the better class of farm-offices of these small proprietors form a jumble of stone, brick, wood, and clay buildings, stuck on one to the other without method or order, generally in a more or less advanced stage of dilapidation, and surrounded by masses of rotting vegetable refuse.

During the course of a long afternoon's walk, and many a peep into barn and granary, I observed two winnowing machines, while I found perhaps a dozen of instances of people separating the grain from the chaff by means of the wind; and this the proprietors of the machines said was still the usual method of the country. The operation was uniformly performed on the road side. A clean sheet was spread, upon which a sieve was laid—the operator then holding a basket above his head, shook from it the mingled grain, dust, and chaff; and the process of separation was afterwards rendered more complete by means of the sieve.

Pigeon towers abounded, and in farmyards which did not boast any, an infinity of roughly-made open cages were frequently suspended as roosting-places for the birds beneath the eaves.

Irrigation forming an important part of the vine and vegetable culture about Blois, the ground is pierced with abundance of wells, some ten feet deep. from which the buckets are drawn up by means of a long hooked pole. It was odd at first to see scores of people dispersed among the potatoes, vines, and melons, continually driving, as it appeared, long poles deeply down into the earth.

A good deal of poultry is reared, but the ducks show a love for the green stagnant pools quite unaccountable, considering the immediate vicinage of the bright waters of the Loire.

In the suburb of Blois, called Vienne, I visited a considerable charitable institution called the *Salle d'Asile*, destined for the reception of the poor of the neighbourhood above the age of sixty years, and of their children while yet too young to obtain their living. It is generally known that the species of poor law which prevails in France excludes all such machinery as workhouses; each commune or municipality looks after its poor. Portions of certain local taxes, although not levied nominally as rates —the octroi for example—go to the support of persons unable to obtain a livelihood; but all the relief thus administered is what we should call out-door. The Blois Salle d'Asile is, therefore, merely an exceptional institution, supported by private revenues of its own; but, partaking as it does in some degree of the nature of an English workhouse, I felt anxious to see how they managed these things in France. Outwardly, then, the building forms three sides of a gravelled square—three great gaunt barrack-looking piles of masonry—a centre and two projecting wings being supported by a detached naked-looking chapel on one side, and a small school-room on the other. On rows of benches, placed beneath the walls, files of old men and women, the pensioners, were chatting and sunning themselves, while half-a-dozen good sisters of charity were ranging a couple of processions of boys and girls—the latter dressed very much in the fashion of some of our own charity schools—for their evening walk.

I was conducted over the wards, which very much resembled, in general plan and arrangement, those of similar institutions in England. Throughout the whole place, however, there reigned a Dutch degree of austere rigid cleanliness. The rooms gleamed and glared with whitewash. They were absolutely ghastly in their unmitigated pallor. In the dormitories, walls, ceiling, bed, were all glistening in the intensity of their bright uniformity. I first saw the men's hospital—the lower portion of the building being equally divided between the sexes, and the children sleeping above. Happily there were only ranges of beautifully clean and neatly made-up beds to repay the visit. Adjoining was the male eating room. Each inmate had his appointed place at the long horse-shoe table, with his own locked drawer, in which he kept his knife, fork, and spoon. There are two regular meals served per day—breakfast and dinner; but all the inmates have bread and cheese *à discretion.* Meat forms part of the bill of fare only twice a week. Fish is forbidden by the rules. On the non-meat days the repasts consist of soups, stews of vegetables, and bread. With dinner each person has a pint of ordinary thin wine; but if they have been engaged in working for the institution—that is to say, cutting or piling wood, drawing water, rolling gravel, and so forth—they are entitled to a bottle. Both men and women make their own beds and keep their wards clean. The male dormitories consisted of huge halls, well lighted and ventilated, with ample space between the beds. The atmosphere was as pure and sweet as out of doors. A crucifix, and a common religious print or so, alone broke the uniformity of the white-washed walls. The children's *dortoirs* were furnishad with iron bedsteads and a lamp to burn all night, because, as my conductor sagely remarked, "Many children are afraid, and would cry in the dark." A curtained bed for the presiding sister of charity occupied a corner in each of the children's rooms. The women's side was in all respects analogous to that of the men, with the exception of the beds in the infirmary ward allotted to the former being nicely curtained with spotless dimity. One or two poor old creatures, evidently near the end of their pilgrimage, were lying listening to the murmured voices of their companions, who sat talking or reading by their bed-sides—the wasted yellow faces of the sick women making a ghastly show, relieved against the intense white of the bed-furniture. Several female idiots were seated in this ward, in chairs made like infants' go-carts. They were in a perfectly cleanly state—as were some unfortunates of the other sex, who occupied similar seats, placed out of doors in the warm sunshine, where the poor creatures basked and stretched, and seemed to enjoy themselves. The women had a day room of their own, crowded with wicker-work chairs, such as we see in French churches, and here they can receive and converse with their male fellow inmates. In other respects the separation of the sexes is rigidly insisted upon. Man and wife upon their entrance are parted, and do not even take their meals together, though they see and speak to each other during the day. The children, besides being taught to read, write, and cypher, are trained in industrial habits. Net-making is the standard juvenile occupation, the greater portion of the products being sent to be sold in Paris. Married persons disenabled from working are received, as well as the old and superannuated.

Altogether the aspect of the place had as little in it of the harsh and repulsive as we can well conceive in connection with a great and strictly disciplined pauper establishment. The inmates were marked out by no degrading uniforms. The Sisters of Charity, who are the managing persons of the institution, mixed familiarly and chatted kindly and cordially with the old people as they walked to and fro, or stood in groups in the sunny yard; while the constant greetings going on between the occupants of the asylum and their friends, who were continually coming and going, gave an air of cheerful heartiness to, and warmed and brightened, the whole scene.

Between Blois and Tours, on the right bank of the river, property is very minutely subdivided, and isolated peasant dwellings common. In a single meadow of moderate size you will frequently see half-a-dozen small square boundary stones marking out the different lots. The cultivation, notwithstanding the great amount of hand labour bestowed upon the fields, is correspondingly superficial and slovenly; the fact being, that what can be done with the hands is overdone, while what can be done only by means of proper and sufficient implements and machines and horse-power is neglected, or only very imperfectly performed. One plough, which I inspected in a field within a mile or two of Tours, was a machine which, except the iron with which the wooden coulter was shod, might have been shown as a specimen of the agricultural implements of a South Sea Island. It consisted of a rough thick pole of wood, to the centre of which the ploughshare was attached, furnished in front with two knotted and twisted branches by way of trams, and behind with a pair of stilts of the same rough manufacture, and not three feet long. The excessive supply of manual labour was everywhere evident. In one field I saw two old women engaged in scattering manure with their bare hands; in another two men were yoked by ropes to a harrow, and were dragging it slowly and wearily across the furrows. The system of ploughing commonly adopted hereabouts is curious. A deep furrow is turned up, and then two very shallow ones—the field being thus converted, so to speak, into a series of narrow strips or ribbons of soil, with semi-ditch-like divisions between them. The waste of land produced by this method must, one would think, be considerable.

In the more marshy meadows, close to the water side, rows of closely planted poplars abound; whole acres of rich grass-land are abandoned to these trees, which run in files at right angles to the river, with, perhaps, some dozen or fifteen feet between each rank. Occasionally you find patches of hemp growing beneath the shade of these not very profitable trees; or, if the land be grass, an old woman is squatted upon it watching a cow, and, perhaps, a couple of goats. Rude huts of wattled bushes and straw stand here and there for the reception of tools, and in order to afford shelter in rainy weather. In the Beauce, by the way, I frequently found cavernous-looking holes, scooped out in the road sides for the same purpose. Amid the vines these places are regularly built stone and lime houses—often, as it struck me, more substantial-looking structures than the dwellings of the labourers. The small farm-buildings were very much the same sort of things as those I have described as abounding near Blois. I came across one cart-shed composed of a framework of straw and wattles, slung by ropes from the projecting branches of a tree, and swaying and creaking as the wind moaned and rustled among its supports.

About Amboise hedges abound among the meadows—generally overgrown sprawling lines of bushes cutting the field into all manner of irregular segments, very much after the fashion of some parts of Devonshire. Ploughing was hereabouts being generally conducted by means of one horse—the first example I had seen in France of such economy of power—while the few sowers in the fields were scattering the grain after the old-fashioned broadcast method. Everywhere the fallow ground was overgrown with weeds, great tall bushes of ragwort covering it, and the same species of plant was common among the potatoes, which were very widely planted, and left ample room for the intrusion of such interlopers.

As you approach Tours, the valley of the Loire contracts, and precipitous limestone banks begin to break the uniformity of the green of pasture, wood, and vineyard. This white and easily-worked rock has been made available, with some ingenuity, for a curious architectural purpose. Wherever the bank is sufficiently perpendicular, it is hollowed and scooped out into cave dwellings, sometimes of several stories. In other instances, the front wall, so to speak, of the houses has been erected—the cliff itself serving both as a support and as the rearward wall. The chimneys of these fantastic houses are tortuous passages cut in the lime-stone, the outward orifice appearing like a small black spot, buried, as it were, in clusters of vines, which scramble along and hold on to every crevice and eave-like projecting table-land where a morsel of soil has lodged.

I made an expedition to, and attentively examined, one of the prettiest of these cave-villages, that of Roche Corbon, about five miles above Tours, on the right bank of the river. The white cliff begins to appear soon after quitting St. Radigonde, the northern suburb of the city; and here and there a caverned house strikes one by the oddity of a glazed window, placed in what appears to be the solid rock. At first, however, the expedient seems principally resorted to with the view of furnishing cellars and hay-lofts for the long row of white villas which extend fully three miles from Tours, dotting the steep declivity of the bank, and overlooking gardens of apparently boundless fertility. It is only a close inspection which shows the high walls by which these latter are enclosed; the masses of festooning vines, and the forests of honeysuckle, ivy, and trained fruit-trees, dressing them in mantles of green, which completely conceal the rough masonry.

The main road lies upon the summit of the great dyke built to keep the "Revolutionary Loire" within proper bounds. Meadows, low and marshy, and frequently overflowed, extend between it and the actual channel of the river; while here and there, where the ground rises in swelling knolls from the water side, it is clothed in forests of walnut trees, in which the people were busy when I passed, securing their harvest. They told me it was a bad year for nuts, as well as for all kinds of fruit; but, notwithstanding, copious showers of produce came rattling down from the branches at every blow administered by men perched up among them, and armed with long poles. The nuts were gathered beneath by women, and carried off in creelfuls to be sold in Tours.

The village of La Roche Corbon is marked by a curious old tower, which is perched upon the edge of the highest peak of cliff above it, and from which the foundations must have been gradually crumbling away; for the structure, which is not unlike a square factory chimney, now actually overhangs the abyss, and will probably soon topple into it. Beneath is the rock-cut village. Leaving the main road, you scramble up one of a series of steep paths between gardens, and reach what may be called the main street of La Roche Corbon—the cottages upon the declivity beneath being constructed upon the lean-to principle against the steep bank, those above being fairly hollowed out of the rock, occasionally faced with masonry, and sometimes approached by flights of steps leading to their grim portals in the stone. The effect is odd and striking in the extreme. Fancy the whole face of the cliff scooped into rooms, and cells, and back-stretching caverned holes. Fancy windows by the score set without any regularity, up and down, here and there, framed in the rock. Fancy outside galleries and ranges of stairs running from ledge to ledge—people now appearing at one black hole in the bank, and anon disappearing at another. Fancy the apertures of dozens of sooty chimneys sending up their thin columns of smoke amid the vines, or from out of the bare face of the stone. Fancy, too, here and there a thin crust of masonry clinging to the rock, where a dwelling of somewhat greater pretensions than the rest has been erected. Then set and frame all this picture in festoons of vines, and flowers, and garden plants. Imagine every plateau of table land, although not a couple of yards square, assiduously cultivated; and every ledge, and the nooks and corners of every crevice and petty ravine, worked up into garden ground, surrounded by fences of loose stone and vine-draped every one of them. Do all this, and you will have some notion of the curious village of La Roche Corbon.

I entered several of the houses. Indeed, the people came out when they saw a stranger, and were most hospitable in their entreaties that I should examine their dwellings thoroughly. The perfect cleanliness of these habitations first struck me. Wonderful to say, there was not a dunghill to be seen; possibly there was no room for them, while the steep slope of the bank effectually prevented anything like the lodgment of liquid filth. Almost without exception the rooms were decently furnished, and kept tidy and neat. In each I generally found a comfortable bed, an old-fashioned highly-polished chest of drawers of nutwood, a fair assortment of substantial chairs and tables, and large chimney-pieces bestriding ample hearths, and crowded with all manner of cheap and gaudy ornaments. The walls were sometimes faced with a thin layer of building stone; occasionally they consisted simply of the rock, furrowed by the marks of the chisel which had scooped the dwelling out. If the room was not large enough to contain two beds, there was generally a second chamber opening to the front. Back rooms, of course airless and lightless places, were common; but they seemed only to be used as receptacles for lumber, and through them access was usually had to the upper story, when the dwelling boasted one. The means of communication were in most cases a ladder and a trap cut in the roof, through which you squeezed yourself into the upper cave, which was sometimes used as a dwelling place, but more frequently as a granary, or hay loft. The people were unanimous in describing their rock houses as being exceedingly healthy. They were, at all events, perfectly dry, and had none of the dank earthy smell which might have been expected. Each man's dwelling belonged to himself.

The people were, almost without an exception, small proprietors. They had patches of vineyards upon the hill, or of corn land in some of the many valleys which ran back at right angles from the river, or a right of pasture in the meadows and wooded land within the dyke. To their occupation as cultivators they also added in a few cases some handicraft, and the women employed themselves in running off the thread from the cocoon of the silkworm for manufacturers in Tours. Their remuneration for this industry is so small, that they told me they never worked at night because what they could gain would do no more than pay the candle light. With their domestic duties to attend to they could make from five to eight sous per day, from 2½d. to 4d.

The quantity of wine about Tours, although not a vintage known to fame, is so great that in every little country village you are sure to come upon two or three cooperage establishments. The mildness of the climate is shown by these *ateliers* being generally mere sheds supported upon posts, without any side walls. The store places above the rock-cut dwelling houses are frequently crammed with hoops and staves; and I was told that most small vine growers have more or less skill as coopers.

Apropos of La Roche Corbon, I ought to have stated that no new houses are allowed to be quarried in the cliff, as the rock is giving signs of a tendency to crumble and slip. One great fragment, however, which fell some years ago, has been hollowed into a couple of the most comfortable dwellings in the village.

EXPERIMENTS WITH MANURES IN THE GROWTH OF TURNIPS.

A number of experiments, for the purpose of testing the comparative values of various manures in the growth of turnips, were conducted last summer on the home farm at Craigie House, for the information of the St. Quivox Farmers' Club. At the request of Mr. Campbell, I examined the different lots, along with Mr. Smith, Nursery Hall, on the 3rd of December; and the turnips were then taken up, cleaned, divested of tops and roots, and carefully weighed under our supervision. And I now have the honour of stating to the club the nature of these experiments, and the results which have been ascertained.

The side of the field on which the experiments were made is well adapted for a comparative trial of manures, as the soil is of a very uniform character. It is naturally poor—the soil consisting principally of hungry grey sand; but, under the liberal management of Mr. Campbell, it has been much enriched. Of this there is evidence in the fact that the lot in the experiments which got nothing produced a considerable crop. The usual experience of farmers is that, when there is nothing applied to turnips in the shape of manure, the return is also nothing. The field, therefore, was in good condition previous to the application of manure for the turnip crop. There were fifteen lots, each of which consisted of three drills; and the centre drills of the lots were alone weighed, that the result might not be affected by the influence of particular manures upon any turnips in neighbouring drills, which might send out their roots unusually far in a lateral direction. Nos. 1 and 2 extend from top to bottom of the field. The other experiments were in small lots of four rods in length; but they were made with the utmost precision. The drills were drawn 27 inches wide, and the turnips singled out 12 inches apart. A few plants had been destroyed, and others injured by wire-worm; but, so far as could be judged from observation, the comparative results were not materially affected by the means, as the different lots appeared to have suffered very much alike.

The first and second lots are the most important experiments. They were manured respectively with dung, preserved under cover according to the dicta of chemists, and various eminent agricultural authorities; and with dung preserved on an uncovered dung-stead, as is commonly practised. These lots were each manured at the rate of 40 farm cart-loads per acre. The lower part of the field is a heavy clay. We therefore weighed four rows near to the foot of the drills, in order to have a duplicate of this interesting experiment. These I shall describe as lots 3 and 4. No. 5 was manured with Peruvian guano, at the rate of 7 cwt. per acre; 6, with 7 cwt. dissolved bones; 7, with 25 cart loads of dung and earth compost, and 3½ cwt. of guano; 8, with 25 loads of compost, and 3 cwt. of dissolved bones; 9, with 7 cwt. of M'Call and Co.'s manure; 10, with 7 cwt. of guano and dissolved bones, mixed in equal proportion; 11, with 25 loads of compost, and 3 cwt. of M'Call and Co.'s manure; 12, with 25 loads of compost and 3 cwt. of dissolved bones; and to No. 13 no manure of any kind was applied. The turnips on these lots were the green top Swedish variety. Lots 14 and 15 were golden yellow turnips. The former of these was manured with water docks and 3 cwt. of dissolved bones; and the latter with nettles and 3 cwt. of the same potent auxiliary. I append the result in a tabular form, stating the weight on 4 rods, or 66 feet, of a drill in each lot; and likewise the rate of produce per imperial acre. The produce per Scotch acre may easily be ascertained to a nearness, by adding one-fourth to the amounts stated.

	lbs.	tons.	cwt.	qrs.
1	159	20	16	2
2	156	20	8	2
3	180½	23	12	3
4	179½	23	10	0
5	194	25	8	0
6	159¼	20	17	0
7	171	22	7	2
8	177	23	3	2
9	134	17	11	0
10	176	23	1	0
11	181	23	14	0
12	168	22	0	0
13	47⅔	5	15	3
14	190½	24	19	0
15	172	22	10	2

It will be observed that the difference between lots 1 and 3, which were manured with dung kept under cover, and 2 and 4, manured with dung kept uncovered, is so trifling as to be practically of no moment. The lot grown on 7 cwt. of guano is much superior to that on an equal weight of dissolved bones, and is the finest in the field—the produce being at the rate of nearly 32 tons per Scotch acre. But again, 3 cwt. of dissolved bones are found to be as good an auxiliary to the dung compost as 3½ cwt. guano. M'Call's manure applied alone is a signal failure; but it seems to be superior to guano or dissolved bones as an auxiliary. I am not acquainted with the composition of this manure; but the experiments lead us to suppose that, while some of its constituents are favourable in a high degree to the growth of the turnip plant, it fails when applied alone to a light soil to sustain the growth during the autumn months, and to produce a bulky crop. The crops of yellow turnips grown upon water-docks, and nettles, with the aid of dissolved bones, are excellent, and point out the propriety of putting to use every description of vegetable matter about the farm.

But the chief feature of interest involved in these experiments is the comparison between the crops grown on farm manure kept under a roof, and those on dung kept in the usual manner. It is an important contribution towards a solution of the question—Whether is it profitable to roof over manure heaps at farm steadings? It is needless to expect that this point will be settled in the laboratory of the chemist. As in many other things, the farmer must, in all likelihood, find out the way for himself, and the chemist will afterwards tell him why his practice is correct. At a recent agricultural meeting, Professor Way, when asked whether the advantages gained by covering a manure heap were worth the expense, replied that "the question was an unfair one, as he could not be supposed to know what the expense would be; but as a principle he would say, by all means cover it over, and if they must dilute their heap, dilute it when they wished, and not let the heavens do it for them. Even if mixed with soil, he wished to say it would be better to cover it." It may as well be said, however, that if the heap must be diluted, in order to keep it in cool condition, it can in no other way be so cheaply done as by the rains; and if these should wash out a portion of the subsoil fertilising matter, a good tank can be constructed to receive it at far less expense than a large roof; and besides, we have here a fact, and one fact is said to be worth a number of theories, that the manure kept in the open air at Craigie Home Farm last winter was as valuable for the growth of turnips as that kept under a roof. The quantity may be a little lessened by exposure; but what remains appears to be, weight for weight, of equal quality. Nor is it likely to lose much if mixed with soil containing a considerable portion of alumina. Professor Way has himself shown, by his admirable discoveries, that such soils possess the power of absorbing and retaining the fertilising properties of manure in so effectual a manner, that no amount of rain will wash them out. With this knowledge it is difficult to discover what great good can result from roofing over a heap of dung mixed with earth. In these times it will not do for farmers to undertake expensive works which may be of doubtful utility; and it is therefore satisfactory to find that some progress has been made in the accumulation of data, from which a correct judgment may be formed. A few more of carefully conducted experiments to confirm or disapprove those of our respected president will be the simplest way of setting the matter at rest; for, with all deference to those who guide as to principles, it is facts from the field which will most readily influence practical men, at least so long as the knowledge of these guides is so incomplete that their deductions are frequently found not to be trustworthy. It will probably be found that dung which is exposed to the summer sun loses more rapidly than that which is winter made; but in the generality of cases at present, the majority of farmers will concur that about almost every farm steading there are many extensions and improvements remaining to be effected, which are of much more urgent necessity than roofs over manure-heaps.—Reported to the St. Quivox Farmers' Club, by James Drennan, Secretary.

PROGRESS AND IMPROVEMENT IN THE CONSTRUCTION OF GLASS HOUSES.

Last week we took occasion to allude to the "Crystal Palace" now erecting in Hyde Park as an example, on a large scale, of the progress and improvement in the construction of glass houses now, compared with that which existed even ten or fifteen years ago. We have, however, on the present occasion to invite the attention of our readers to a very different kind of erection, named by the inventor (Mr. Rivers) "Orchard House." Fig. 6. is a section of one of these houses, which we recently saw at the Nursery, Sawbridgeworth, and will convey an idea of the size and form of these structures. Mr. Rivers, in his "Orchard House,"

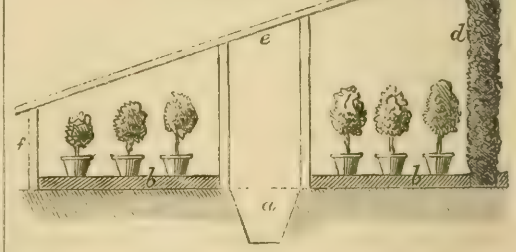


Fig. 6.

just published, and which we lately noticed (page 5), says:—"I have an orchard house 90 feet long, 12 feet wide; rafters (*e*), 4 inches by 2, and 14 feet long; the back wall of which is a fine beech hedge (*d*), 20 years old, 8 feet high, 1½ feet thick; the front (*f*), 1½ inch boards: the board next the glass, 15 inches wide, is on hinges, and is always open in warm weather. This house is glazed with 16 oz. sheet glass, 20 by 12 placed cross-ways, so that the rafters are 20 inches apart. The glass is foreign, of the cheapest description, and cost 2½d. per foot. Under ordinary circumstances, I should have much trouble from scorching, as it is very irregular, and many foci are formed; but the gentle percolation of the air through the hedge is so constant and so regular, that not a scorched leaf is to be found in this orchard house, in which are above 700 peaches, nectarines, apricots, and figs in pots; a few pears full of fruit; a few plums the same: everything is in perfect health—the shoots of the peaches and nectarines in particular are beautifully ripened. Now, what can tell more forcibly that scorching is the result of imperfect ventilation?" This, then, is so far Mr. Rivers' own account of his orchard house, as to how it is constructed, what it contains, and what it is expected to produce. We may remark, in order to complete the structural description, that the ends are composed of boards, or felt fastened upon boards. A sunk path (*a*) extends through the centre of the house, with a raised bed (*b*) right and left; and on these beds peaches, cherries, nectarines, figs, vines, plums, pears, and we know not what besides, take their place on either side, and are grown in pots and vases—not planted in the free border; and in this consists a chief feature of the novelty and interest of Mr. Rivers' system. The following are the reasons which he assigns for preferring pot culture to the free soil: "It is very possible," he says, "that some who read this may say—'Why not plant the trees in the raised beds rather than in pots and vases?' To this I reply, they cannot be kept under control, even with annual root-pruning. I have some peach trees which have been planted in raised borders of one of my orchard houses for years: they bear admirably; but, in spite of root-pruning, they will grow too rapidly. Now, in pots, the size and growth of the tree may be regulated with the greatest nicety; the annual root-pruning can be done with facility; and there is no occasion to dig and disturb the borders, which must be done to a great extent to root-prune properly trees planted in them. In fine, as far as my experience has gone, I can imagine nothing so eligible as pots or vases for fruit trees in orchard houses, 'or fruit conservatories.'" The kernel of Mr. Rivers' system will, however, be found in the following remarks: He says, in 1849 he attempted to grow figs in one of his vineries, but found they required more room than he thought it desirable to allow them. To meet this difficulty, he adopted pots, and set them on the raised border, right and left of his sunken path. The roots, he observes (and this we regard as the chief point of interest), "made their way through the aperture at the bottom of the pots: and the plants thus, even in comparatively small pots, attained enough of vigour to support a crop of fruit. After the fruit was gathered, the pots were gently turned up on one side, and the roots cut with a knife. Water was withheld, and the plants were soon at rest, with well-ripened shoots." The following spring (1850) they were top-dressed with manure, the aperture in the bottom of the pot made wider, for the free egress of the roots into the border, on which they were again placed as before; and the result, we are told, was most favourable. By a natural deduction of reasoning, it occurred to Mr. Rivers that since figs could be treated successfully in this way, why not peaches and other kinds of fruit trees already noticed? The attempt was made, and the following is Mr. Rivers' own account of the trial:—"I have now," he says, "much pleasure in giving the simple method by which all these choice fruits can be grown on dwarf bushes with a certainty of a crop every season; and I hope to see the day when hundreds and thousands of our small gardens will be furnished with orchard houses. It must be understood that I mean by this term, houses in which no fire heat is used; in them our climate is merely assisted by glass: forcing houses require more attention; but a forcing orchard house, built exactly as above, with a brick Arnott's Stove

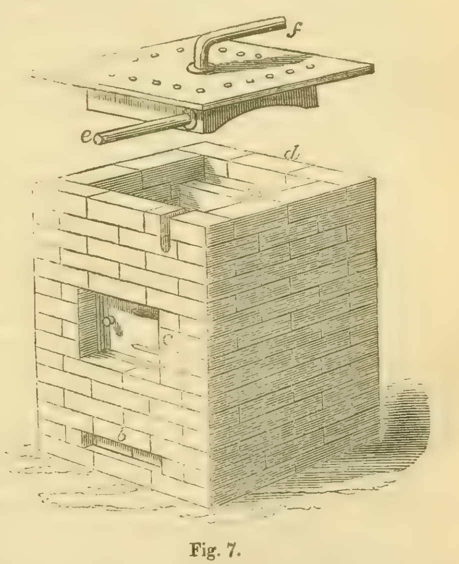


Fig. 7.

Perspective elevation, showing the small boiler with its projecting cover, made to fit over the brick-work of the stove—the principal part of the boiler being constructed to fit within the brick sides. *(e)* return pipe about inch-and-a-half diameter; *(f)* flow pipe same size. *Stove:* *(d)* four-inch brick sides; *(c)* furnace door; *(b)* ash-pit door.

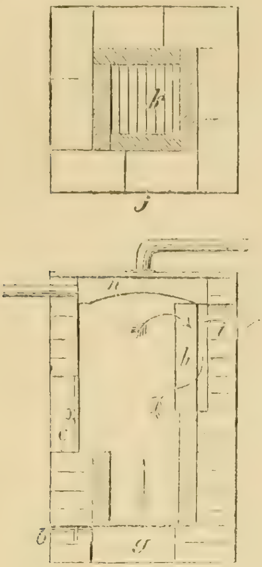


Fig. 8.

Horizontal section; *(k)* showing the fire bars and the Welsh lumps forming the sides of the fire place. *Vertical section:* *(c)*, furnace door; *(b)*, ash-pit door; *(n)*, boiler; *(i)*, entrance into smoke flue; *(h)*, Welsh lump rising from the back of the fire, and covering the mouth of smoke flue to prevent excessive drought, and the too rapid escape of heat from the fire-place. Mr. Rivers says, "I have now 12 of these Arnott's stoves, and have never yet seen any mode of heating small or moderate-sized houses so efficient." He says, a stove 2 feet 4 inches square, outside measure, and 3 feet 10 inches high, the fire 8 inches over and 8 inches deep, will heat a house 20 to 30 feet by 12. One 2 feet 10 inches diameter, and 3 feet 10 inches high; the fire-box, 10 inches over and 10 inches deep, will heat a house 40 by 12. Mr. Paul, of Cheshunt, has one or two of these stoves in use. In due time, we shall learn the result of the trial there, which we shall not neglect to report, be the result what it may.

in the centre of the back border, will answer admirably, and give strawberries in March and grapes in May." We have thus as briefly as possibly endeavoured to bring before our readers the prominent features of the system in question: that is, first, the simple and inexpensive structure required; the culture of the plants in pots instead of the free soil of the border; and, most important of all, the annual check given to the roots to prevent over-luxuriance, and keeping the plants dry, and insuring a period of complete rest. To all persons who are in any degree familiar with the habits of our tender fruits—such as peaches, nectarines, apricots, plums, cherries, and many others—it is well known, that when grown to their natural size, they require much room. There is a peach tree, for instance, at Chatsworth, completely filling a house some forty feet in length; single vines in other places occupying thrice that space. To grow trees in this way is quite out of the question, so far as amateurs and persons of limited means are concerned; and yet such persons have as great a right to eat and enjoy figs, grapes, and peaches, if they can afford to grow them, as any one else. It is this very laudable object then which Mr. Rivers proposes his orchard houses shall accomplish; and let us say here, it is to such persons only which Mr. Rivers addresses himself. The principle, however, belongs to the science and practice of horticulture; but those professionally engaged in its general pursuits will not fail, we dare say, to discover in it, and draw from it, some useful hints. We would especially direct their attention to the practice of permiting the roots of the plants to grow into the border, and thus obtain an accession of roots and additional food at the very period when it is most of all wanted. The practice of giving a season of complete repose in a *comparatively dry atmosphere* is also a most vital point in the science of culture.—Gardeners' and Farmers' Journal.

ON DRAINAGE.

CHIPPENHAM HUNDRED FARMERS' CLUB.

The first regular meeting of this Club was held on the 16th Dec., 1850, Mr. **Robert Davis Little** in the chair.

The subject of "Drainage" having been fixed on for discussion, and Mr. T. C. **Scott** (agent for Joseph Neeld, Esq., M.P.) having agreed to open the question, rose and addressed the meeting as follows:—

Gentlemen: I feel highly complimented in being called upon by you to introduce the first subject appointed for discussion at this club. At the same time, I feel some diffidence in bringing forward a subject so important, especially as it is one that has lately undergone so much discussion by men of ability and scientific knowledge. A sincere desire, however, to impart whatever practical information I possess on this important subject, has alone induced me to undertake this duty.

The more the subject of drainage is discussed, the better it is likely to be understood, and it is absolutely necessary to fix its general principles clearly in our minds, to enable us to settle to our work with that degree of confidence which is essential to success in practice.

The records of the application of drainage to the improvement of land go back to a very remote period. We read in the writings of Virgil and others of drainage operations carried on by the Romans nearly two thousand years ago, and they appear to have been familiar with it as a system. Two hundred years ago, Blythe, in his "Improver Improved," addressed to "Cromwell," strongly urged the necessity of carrying out a system of drainage there laid down. In Essex, nearly 150 years ago, furrow or parallel drainage was practised; and about

50 years later, it was applied, to some extent, in several of our southern counties. We hear little more of it until it was again revived, upon a new principle, by Elkington, in Warwickshire, about the year 1770; and after his day, it seems to have lain almost dormant for half a century. Elkington's system being that of tapping springs, sometimes at great depths, and of bringing up the water, as we do in wells, and then carrying it off by an ordinary drain, was not generally applicable, only a comparatively small portion of farm land being subject to wet from this source; and I believe the celebrity which this system procured for Elkington, coupled with a large grant of money from Government, was owing more to his personal ingenuity and skill in carrying it out, than to the value of the principle involved. We may naturally infer that disappointment in its results must have occurred early after its introduction; for its practice generally was soon abandoned, although there was no rival system at that time ready to supersede it. After that period the science and practice of drainage remained in a comparatively quiescent state for nearly 50 years, or from about 1780 to 1830. No doubt, many individual cases of spirited attempts at draining, during this interval, could be traced out; but it was a mere groping in the dark, no principle or system being under discussion, or settled in men's minds.

About the year 1830, Mr. James Smith, of Deanston, roused the country from its lethargy, and succeeded in producing what may be more correctly designated a *revival of an old*, rather than a new system. The good he did, however, cannot be easily over-estimated, as he inspired an interest in other means of improvement, as well as in drainage; and, by his writings and example, gave a legitimate direction to the capital and enterprise of the landholders throughout the country, and caused much labour to be absorbed, with great benefit to the nation, if not in all cases to individuals. But though Mr. Smith was a man of science, as well as of practice, his principles have undoubtedly been lately superseded (by fair reasoning and detailed experiment) by those of Mr. Josiah Parkes; and within the past six years most practical men, who have given consideration to the subject, have had their minds fully set at rest as to the true principles of drainage.

The necessity of drainage is now so generally admitted, that I need not enter at length into its merits. When I state that nearly one-fourth of the area of the United Kingdom, or 20 millions of acres, require drainage—that it would employ 100,000 men for 50 years, and require an outlay of £80,000,000 to accomplish the work—you will see how important it is to have its principles correctly understood, and its practice properly carried out. It may be long before this gigantic task is accomplished; but as upwards of *three millions* has already been granted by government on loan, and greater facilities given for obtaining private loans for this purpose, we may conclude that capital will continue to be directed into this channel, in an increasing ratio, for national as well as individual improvement, and that it will obviate the necessity which, through the poverty of landlords, or the temporary interest of tenants, has hitherto confined it to such a limited scale, and induced a preference for cheap and superficial, instead of permanent, drainage.

It is well established that drainage improves the climate, as well as the soil—that it is equally conducive to the health of beasts as of man—that it gives us an earlier spring, and brings an earlier harvest by at least 10 days—and that it lengthens our summer by enabling us to turn our cattle out earlier and to keep them out later. Drainage also eradicates thistles and other weeds, and aquatic plants—cures and prevents rot in sheep, and brings inert vegetable matter into action. It is not, however, an antidote to poverty in the soil, but only brings it into a state of greater fitness to hold and distribute the proper food of plants.

I, and many others, have found that grass land, when drained and immediately broken up and sown with oats, produces, in an ordinary season, a smaller crop, both of straw and grain, than it would have done in an undrained state—that this does not hold good with other cereal or pulse crops; and for all bulbous and other root crops, which delight in vegetable matter, drainage is equal to an ordinary manuring, even the first year, and the soil is ever afterwards much more grateful for manure.

Nearly all manures are inoperative on wet land, and lime actually injures it. Wet clay lands are almost worthless until drained, but none are more grateful for drainage and manure. Many porous and gravelly soils are also much benefited by drainage, as I have proved in many cases where it was supposed that drainage was not required. Much stagnant water lies under such soils unseen and unsuspected, and no cereal, pulse, or root crop is safe from its injurious influence until it is removed.

The working of land is also much easier after drainage, though the first ploughing will generally be found more difficult, in consequence of the contraction of the soil; but immediately afterwards it produces amelioration and facilitates disintegration.

The want of drainage on wet land being thus admitted to be a complete barrier to agricultural improvement, I shall now endeavour to explain the principles on which drainage ought to be conducted. I must beg you, at the same time, to bear in mind what I have found during 13 years' experience, that we must occasionally deviate in our practice to suit locality and other circumstances. Such deviation, however, is seldom caused by the want of *fall*, for in almost all cases a suitable out-fall *can* be obtained, and I would prefer a nearly dead level to giving up an inch of the depth I wished to obtain.

I put the above remark in, as a saving clause, in case any discrepancy between my practice and principles may be discovered in the extensive operations which I am now conducting for Mr. Neeld.

In the wet climate of the west of England land requires more drainage than similar soil on the East coast, where the climate is drier; for it is advantageous to remove by filtration through drains—on the principle of irrigation—as much as possible of the water that falls on the surface, and to allow as little of it as possible to be carried off by evaporation. You will the more readily perceive this by bearing in mind that rain penetrating the soil carries ammonia and warmth along with it, to nourish and stimulate the growing plants; but what cannot escape by percolation becomes stagnant and injures vegetation, or goes off by evaporation, thereby lowering the temperature of the soil and the surrounding atmosphere; for it has been found, by actual experiment, that rain of an average temperature falling in summer *raises* the heat of the ground 3 degrees for 7 inches in depth; but, if carried off by evaporation instead of by drains, it lowers it, for the same depth, about 3 degrees below the temperature at which it stood when the rain began to fall. Now, as the average quantity of rain falling annually in England over an acre of land is about 110,000 cubic feet, equal to 3,000 tons, or nearly 8½ tons per acre per day, you will see the importance of drawing this off by drains, instead of allowing it to escape by evaporation. The importance of drainage is rendered still more striking when we know that five-sixths of the water falling on the surface of *wet land* is carried off by evaporation, and only one-sixth by filtration. This has been proved by Charnock's Meteorological "Tables" published in 1843 or 1844. Therefore, on drained land, every drop of rain that falls carries food and air and warmth to all our cultivated plants; but on *undrained wet land* it produces cold, and promotes the growth of weeds and aquatic plants.

I shall now state a few of the reasons which have induced me to adopt and recommend the practice, generally, of deep drainage. I believe there are few, if any, soils on which it is not more generally applicable, if properly applied, than is usually supposed. I say this, notwithstanding a paper to the contrary, published by Mr. W. B. Webster in the Royal Agricultural Society's Journal a year or two ago, wherein I conceive a very meagre and superficial reply is given to the astute and philosophic reasonings and facts of Mr. Parkes, supported as they are by the practical experience and opinions of men of the highest intelligence. I am also disposed to assert that uniform depth in drainage on all soils is more generally applicable than has yet been admitted, for depth is principally intended to counterbalance the power of capillary attraction and absorption, or the action of the earth and atmosphere in drawing up and holding moisture: these influences being nearly uniform in their action. But I do not contend for a *uniform distance* between the drains, because distance must be dependent on porosity, or the texture of the soil and subsoil, which vary from the almost impervious clay to the open gravels and running sands. You must here observe the distinction between common attraction and capillary attraction: the first brings moisture from above in the shape of dew, &c., and nourishes plants; the other draws it from below and injures vegetation; and the latter influence being greater in porous than in retentive soils, the porous soils should be drained the deeper of the two, where a distinction is to be made in depth. Capillary attraction is also greater in an open than in a covered drain, as may, for example, be seen by the moisture which rises up the sides of an open ditch, or around a common pond, and it is therefore unnecessary to keep drains open for a time after they are cut, as they sometimes are, to allow them to "draw," as they will "draw" more rapidly, and retain the water below more effectually, when covered than when open. Further, capillary attraction and absorption have the power of drawing water lying at a depth of four feet below the surface, about 12 inches above its bed in porous, and 10 inches in clay soils.

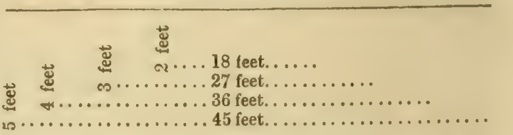
An allowance in depth must also be made for the subsidence of land after drainage; in proof of which, I have laid upon the table a letter from one of the largest occupiers of land in the Lothians, stating that above 100 miles of drains put down under my superintendence 10 and 12 years ago, at depths varying from 27 to 36 inches, are now being taken up and relaid from 42 to 48 inches deep, in consequence of its having been found that they had been raised, through such subsidence, to within 20 and 30 inches of the surface. The subsidence of soils will of course vary; as, for instance, on soils of a peaty or spongy nature, it will be greater than on clays; and the drains ought to be laid deeper in proportion to its probable extent. Shallow drains, or drains stoned too near the surface, are objectionable, as they carry off the substance of manures, as well as the ammonia contained in the rain water, as proved by analyses of water discharged by such drains, and which water has been frequently found to contain a considerable quantity of nutritive matter; whereas the water discharged from deep drains is perfectly pure, having left all its good properties behind it.

Deep drains, likewise, remove stagnant water from below, which shallow drains do not, and they are more secure from being injured by the roots of trees, sediment, fungi, &c., and also less liable to be burst by severe frosts or other causes.

Deep draining has also economy on its side, as you will see by the following scale of depths, distances, and prices; but this recommendation I should not quote, did I not believe it at the same time gave greater permanency and equal effect. The principle on which the following scale is based is to afford, in each instance, the same degree of inclination from the surface—taking the centre point between drain and drain—and supposing water to travel down an inclined plane, thus:—

ILLUSTRATION—1-10TH OF AN INCH TO A FOOT.

Surface of Land.



COST PER ACRE, ACCORDING TO THE ABOVE SCALE, ON STIFF SOILS, FREE OF STONES, AND EXCLUSIVE OF CARTAGE OF MATERIALS:—

I. Drains, 2 feet deep, 18 feet apart, 1¾ inch pipes—2,420 at 17s. 6d. per 1000	£2	2	4
Digging, breaking, and filling stones, 24 cubic yards at 9d. per yard	0	18	0
Cutting, laying pipes and stones, and re-filling soil, 36.67 chains at 1s.	1	16	8
Cost per acre	4	17	0
II. Drains 3 feet deep, 27 feet apart, 1¾ inch pipes—1,610 at 17s. 6d. per 1000	1	8	2
Labour as above, 24.39 chains at 1s. 6d.	1	16	7
Stones, same as above	0	18	0
Cost per acre	£4	2	9
III. Drains 4 feet deep, 36 feet apart, 1¾-inch pipes—1,210 at 17s. 6d. per 1000	1	2	2
Labour—18.33 chains, at 2s. 3d.	2	1	3
Stones	0	18	0
Cost per acre	£4	1	5
IV. Drains 5 feet deep, 45 feet apart, 1¾-inch pipes, 970 at 17s. 6d. per 1000	0	17	0
Labour	2	4	1
Stones	0	18	0
Cost per acre	£3	19	0

I must also add, that no description of draining can fairly be criticised until it has been at least twelve months in operation.

The above is a brief outline of the principles which I am now acting upon; but although I am able to say that I have found them correct in other localities, and have every confidence in acting upon them in Wiltshire, still my knowledge of the geological character of the districts which I have now to deal with, is not sufficient to entitle me to assert, that I *have* not, or *may* not, put in a single drain at a wrong depth or distance; for I am quite aware that such knowledge is of great value as an adjunct to practical experience, and that however clearly established the principle may be upon which we proceed, it must, to some extent, be adapted and modified to the locality in which we are to carry it into practical operation.

On the Grittleton estate alone I am now executing for Mr. Neeld permanent drainage at the rate of *three* miles per day, equal to 18 miles per week, or 900 miles a year. In the course of these operations I have met with a greater variety of subsoils than I supposed to exist in any one district—namely, clay, quick and solid sands, gravel, stone brash, and sand stone and solid rock. The depth of the drains varies from 3 to 5½ ft.; the distance between the drains, from 20 to 60 feet; the 3-feet drains have only been adopted in clay soils and where old furrows come in the line of the drains, which will leave the drains about 3½ to 4 feet deep, when the land is levelled. The tools which I use consist of three sets, adapted, respectively, for clay and sand, for loose stones and brash, and for moor-band pan and solid rock; they consist of a turf-knife, a common spade, two bottoming bits, two crumbers or narrow scoops of different widths, a narrow shovel, a pick, a rock-chopper, and a pipe-layer. In addition, I employ a spirit or a mason's level, a drain gauge, a pipe-holder for drain mouths, wire gratings to keep out vermin, and also rings for measuring broken stones, if any are required. In all cases I have used circular pipes from 1½ inch to 4 inches in diameter, costing from 14s. to 37s. per 1000, the size of the pipes being always increased in proportion to the accumulation of water. In sand, gravel, and open brash, the ordinary drains are dug from 4 to 5 feet deep and 6 inches wide, and from 30 to 60 feet apart: the conduits in these drains are pipes and collars from 1¾ inch to 2 inches in diameter, and, in some cases, clay is placed around them to prevent running sands silting them up. In clays the drains are dug from 3½ to 4½ feet deep, and from 20 to 36 feet apart, and just sufficiently wide to admit the pipes, which are 1½ to 1¾ inches in diameter, and are laid without collars, and from 4 to 6 inches of stones, broken to pass through a *three*-inch ring, and costing about a farthing per yard, are laid upon them, and the clay is then trodden in over all. The main drains are always 4 inches deeper than the ordinary drains, and the pipes are from a third larger to double the size; they have also double the quantity of broken stones placed over them, a practice which I am aware is condemned by many; but I think it necessary, and have found it safe.

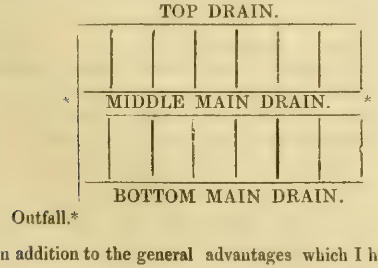
As some of the members present may not have thought of the relative size or area of pipes of different diameters, I may here state for their information, that

A pipe 1½ inch in diameter	is equal in area to	2½	one-inch pipes.
„ 2 inches	„	4	ditto.
„ 2½	„	6½	ditto.
„ 3	„	9	ditto.

And so on in the same ratio.

I need hardly state that the horse-shoe tile and sole have been almost everywhere superseded by pipes during the last six years.

In fields of uniform texture, the ordinary drains should run parallel to one another, at equal depths and distances, and at right angles to the bottom or main drain; in other cases the judgment of the drainer must regulate their position. The top ends of the drains should always be deeper than the lower ends, if the fall will admit of it, as it is there the water generally rises—and they should all be joined into a top drain to admit of a circulation of air, to dry the head ridge, and intercept springs. An outlet should be given for every *five acres*, and if the run of the field be too long, the drains can be cut off in the middle, and the water sent down by a main drain, thus:



In addition to the general advantages which I have already stated as resulting from drainage, I shall shortly state the actual results of some of the drainage operations which I conducted in Cheshire between the years 1841 and 1842, and for which I twice obtained the drainage medal of the Manchester and Liverpool Agricultural Society.

The first case which I shall adduce is a fair average of the others.—It is a *thirteen acre* field of stiff brown loam, resting on tenacious blue clay and marl, and had been let at 17s. 6d. per acre; it was drained early in 1842, with 2½ inch tiles and soles, laid 3 feet deep and 22 feet apart; it cost—

Labour............	£24	1	4
23,000 tiles and soles	40	10	0
	£64	11	4, or nearly £5 per acre.

It had previously been cropped as follows, without manure:—In 1838, wheat; 1839, oats; 1840, bare fallow; and 1841, wheat. After drainage it was deeply ploughed and worked by Finlayson's grubber, and sown with Swedish turnips, manured with 160 cubic yards of good well-rotted cow-dung, 4 cwt. of guano, and two tons boiled bones. The produce averaged 30 tons per acre, and some of the bulbs weighed 17½lbs. They were all pulled and consumed by cattle in the house.—The next crop was wheat, sown on the 7th March, producing 290 bushels, equal to *twenty-three* bushels per acre. It was sown down with permanent grass seeds, and let for grazing with ewes and lambs at £30, or 46s. per acre. The party who paid this rent, having sold all his stock and made a fair profit, obtained permission to sublet the field from 6th October to 6th December, and obtained for these two months a rent of £10, which was nearly equal to the previous tenant's annual rent. In this case, the rent to the landlord was nearly three times its former amount, and the tenant's profits probably greater at that rent than his predecessor's at 17s. 6d. per acre. The original annual value of the field—

Being....................	£12
Its new value..............	30

The difference............£18, or upwards of 25 per cent. per annum on the outlay of £64 11s. 4d.

The next field was of the same value, was drained in the same way, broken up from grass, and the first year produced oats worth £4 5s. per acre; 2nd year, potatoes, sold at £20 10s.; 3rd year, wheat, valued for tithes at 30 bushels per acre, worth, according to the then value, £10 10s. The cost of drainage was £4 15s. per acre, and the field was valued the third year by a land surveyor at £2 10s. per acre, thus yielding 20 per cent. on the outlay for drainage. In both these cases the crops repaid the manures, labour, and current expenses, and the land was not, therefore, liable to be charged with anything beyond the outlay for drainage.

It is unnecessary to adduce any more cases, as they are all similar and yielded equally remunerative returns; but I need not remind the practical men now present that these results were obtained in more auspicious times than the present.

I have thus given you a brief outline of the principles and practice of land drainage, so far as they have fallen within my knowledge and experience; and I have now only, in conclusion, to hope, that however imperfect this sketch may be, it will at least have furnished you with some hints that may be turned to profitable account.

A discussion followed, in which a number of the members took part, and supported generally, the views explained by Mr. Scott, considering them in favour of a medium between shallow and the very deep draining now in vogue.

Mr. Edward Little, of Sheldon, stated that some drains which he had been instructed to put in, on the Marquis of Lansdowne's estate, in this county, a few years ago, at the depth of four feet and upwards, with the clay rammed on the top of the pipes, had effected little or no good; but that on his own farm, drains which he had constructed ten or twelve years ago, from *two* to *three* feet deep and filled with stones, were still perfect and efficient.

Mr. **Blake**, of Grittleton, also stated his experience as a drainer with stones during the last twenty years; and though he now preferred pipe draining, he contended for a greater quantity of stones on the top of them than 4 or 6 inches.

Other members then took part in the discussion, and asked for explanations on several points, which Mr. Scott gave, stating that he hoped the meeting would not give a preference to shallow and stone drains *because they* drew the rain water off the surface quicker than others; but would adopt such drains as would draw the water off in a reasonable time, and be permanent. He also stated that deep drains in gravelly soils have been known to prevent the land from "burning" in summer, though it had done so before; and on clays, it prevents cracking to the extent it would otherwise do. It was sometimes, however, very expensive to bring up level to deep drains, and existing ditches were seldom sufficient. Mr. Scott did not think it necessary to say anything on sod wedge, and mole plough draining, as these operations were of a temporary character. He had, however, seen sod draining on peat bog, where pipes could not be laid, which had lasted sixty years.

The **Chairman** reviewed, in a clear and dispassionate manner, what had been stated, and summed up very ably; and the following resolution was then agreed to:—

"That in the opinion of this meeting a good system of draining, liberally carried out, would be highly beneficial to this neighbourhood; that the variety of soil in the district precludes the possibility of adopting any general principle—pipe, stone, and turf drains having the advantage according to circumstances. That the most permanent system of draining known at present is when done with PIPES, at not less than *three* feet, and distances to suit the soils. That in open or porous subsoils, collars should be put on the pipes; and in clay soils, six inches of stones broken to pass through a *three*-inch ring, should be laid over the pipes, and the clay returned on them. That the manner in which draining can be done, so as to be most beneficial to the landlord and tenant, is for the landlord to pay all expenses connected with the same (the tenant doing the haulage), and charge the tenant a reasonable per centage for the money expended, which per centage this meeting thinks should be 5 per cent. per annum."

PEAT CHARCOAL.—THE IRISH AMELIORATION SOCIETY.

PUBLIC MEETING AT EDENDERRY, KING'S COUNTY, IRELAND.

A request having been conveyed to Jasper Rogers, Esq., the Directing Engineer of the Irish Amelioration Society, to attend a meeting of the inhabitants of Edenderry and its locality, with the object of having a station for the manufacture of peat fuel and charcoal in that neighbourhood established by the Society; and he having named Wednesday, Jan. 29, for that purpose, the meeting took place accordingly, in the Court House of the Town, and was attended by above 500 persons. R. R. Murray, Esq., agent to the Marquis of Downshire, who possesses a large property in that part of the country, was called to the chair. He opened the proceedings by stating that Mr. Rogers had kindly consented to attend that meeting for the purpose of explaining the objects of the Irish Amelioration Society, and how its great benefits might be extended through the country; and he would, without further preface, beg of Mr. Rogers to be good enough to favour the meeting with any statement he might feel right to mention.

Mr. **Rogers** then came forward and said,—Mr. Chairman and Gentlemen: In complying with the request made to me to attend the present meeting, I do so with much pleasure, feeling that the objects of the Irish Amelioration Society cannot be too generally understood; and I shall endeavour to explain them in such a way as they may be fairly judged. But first, let me say, that to establish the society has been no small task: and let me tell you why it has been a task. First, when I began my efforts, not far from six years since, almost all classes of Irishmen were opposed to each other, and there was no confidence between man and man *at home*. Then, when I determined to try and enlist the sympathies of *England* for the poor *Irish bog-trotter*—(Hear)—I found there was not only no confidence in *him*—for I was told, over and over again, that *he would not work, even if he was paid*—but I found also that there was no confidence in anything Irish, as the term went, and for two years nearly my own familiar cognomen, amongst many in London, was *the Irish bog-trotter*. (Hear, and laughter.) I might as well have then sought to move a mountain as to move the prejudice then existing. And was it to be wondered at when Ireland herself cried *herself* and each other down; when landlord cried down tenant, and tenant landlord; when the rich cried down the poor, and the poor the rich; when he of *one party*, who sought to accomplish good, was cried down by *the other*; and when he of *neither party* trying to give his aid, was cried down, and would be damned by both (Hear, hear)? And then who suffered most during all this meaningless strife? The *poor labourer*, whose name had been trumpeted forth to the world as "*idle*," "*lazy*," "*indolent*," "*ungrateful*," and bad in almost all things. Those who, "*touring*" through the country, saw the people "*idling*," simply because they had no work, thought them *lazy*, for it appears they *sat* in place of *stood* when "*doing nothing*." And *indolent*, because they smoked their *miserable pipe*, whilst the happy tourist revelled in dozens of *cigars*. Still such was and is the character of the Irish peasant in England; and, I grieve to say, even yet *Irishman seeks to strangle Irishman* (Hear, hear, hear). Why should this be? England and the English support and help and aid each other, Scotland proverbially aids Scotland, but Ireland *drags down herself* (Hear, hear). Now, how is that to be remedied? Thus: We must redeem our characters by proving the contrary. We must aid and help each other; and the *labourer*, whose character is so maligned, must, by his doubly good conduct raise for himself that respect which, in my heart, I believe he deserves (Hear, hear.) Fifty years of experience tells me that I am right, although I am only at the wrong side of forty (Hear, and laughter). My experience is that learned from my father, an Englishman, who spent more than half his life in employing the labourer of Ireland, and whose experience, added to my own, convinces me, that if fairly treated, he is a good and honest workman (Hear and cheers). But, "*my lads,*" whom I see at the end of the room, *hear me:* you must work, like all other Irishmen, for a good name. You must earn what you get. You must even *more* than earn it till you get your good name, be it day-work, task-work, night-work, or ought else—the work must be done when given to you; and believe me, when you show you can work (and I never saw your equal when *put to it*), England's feelings will change—England's money will come amongst you in plenty, and with it England's confidence and affection (Hear, hear, and cheers). But now, as to the *Irish Amelioration Society*—I believe it deserves its name; and its directors, a body of English and Scotchmen, deserve the good feeling of all Irishmen. On the table I have placed its prospectus and other papers, to explain fully its objects, which I shall now shortly tell you. It has been established under a royal charter of incorporation, which gives it high privileges, and limits all responsibility to the amount of the share, which may be taken by each shareholder. Six per cent. interest is to be paid out of the first earnings to all who subscribe; then a fund, say of two per cent., is to be reserved to cover any mercantile losses; and what ever profit is over, is to be equally divided between the proprietary and a fund called *the Amelioration fund*, which is intended to be used in advancing the social condition of the labourers whom we employ, and others in the neighbourhood. Suppose our whole profit to be—as I believe it is now on the operations at Derrymullen—30 per cent., the shareholders would have, in the first instance, 6 per cent., 2 per cent. would be reserved, and 22 per cent. divided. Thus, the shareholder would have 17 per cent. for his money, and the Amelioration fund 11 per cent. Now although the policy of this part of the measure has been questioned, I no more question it now than when I laid it down originally; and I feel as satisfied as that I have the honour of addressing this meeting, that the more we in reason and propriety advance the condition of those who by their labour give to us our food, and clothes, and comforts, the more will we conduce to our own welfare and happiness; and that in the proportion we raise them in the scale of humanity, *so will we raise ourselves* (Hear, and loud cheers). Such are the objects of our Society. We hope to extend it steadily; at first into the poorest districts; but in the interim of our progress, if any special locality desire a station, a subscription of 500 shares will enable us to effect its wish, the Society supplying any further sum which may be necessary, and being bound to expend on that locality its own subscription. As in such cases the shares (each £10) will be "paid-up shares," the Royal Charter obliges the payment of 5 per cent. interest; therefore, the holders will be paid interest of 5 per cent. from the commencement (Hear, hear). Let me now tell you that the experiments recently made in France, by *peat fuel* cut on the bog of Allen, proved that, prepared under the patent process, it is a better fuel than *coal coke* for locomotives; and the coke will cost in Ireland about 40s. a ton, while the peat fuel will not cost *a fourth of the money.* Then our demand for sanitary and other channels is more than we can hope to supply for many a year. But lest you should be uneasy about "*all the turf being cut away,*" and that you could have no firing, it is right I should say, that supposing London should take 2,000,000 tons a year—which I believe it yet will—and all the other cities in proportion, *you have about as much turf in Ireland as will last you for the next 6000 years.* (Hear, hear, and laughter.) I need not trespass on you longer. I need not tell you what the works of the society have done at Derrymullen. The whole district was in abject want when we went there. It is now in comparative comfort; the poor's rates no longer grind down the farmer, and the landlord too; and the people are, it may be said, happy. (Hear, hear.) My conviction is, that, wherever we establish a similar station, a similar result will follow. It is not the object of the society, as the prospectus shows, to draw to one locality large masses of people. The Royal Charter almost stipulates for the establishment of 200 stations over Ireland; and when that is accomplished—which I trust in God is not very far distant—we shall find that whilst the proper labour of the country is not interfered with, that which has been termed the *surplus labour* will have been provided for; and just in the proportion that we put money into the hands of the labourer, so will it come back to ourselves—not only in money but in happiness.

Mr. Rogers having sat down, three cheers were called for, but they were extended to *nine*, and lasted with the utmost enthusiasm for several minutes.

Mr. Wright said that he had listened with great pleasure to Mr. Rogers's most able address, and that he begged to state one fact: when the works at Derrymullen commenced, the poor-rate in its electorate, Kilmague, was 6s. 9d. in the pound; *now it was but one penny;* and so he hoped it would continue (Hear, hear, and great cheering). In fact, there could be no doubt that "wherever similar works were established similar results would follow" (Hear, hear).

Several other gentlemen spoke to the same effect, when Mr. Rogers was requested to favour the meeting with a description of his mode of planting potatoes with peat charcoal.

Mr. Rogers again came forward, and said—"I have much pleasure in complying with the request of the meeting to describe my mode of planting potatoes: it is not a novelty, as I have proved it yearly since 1845. I am not one of those who think the use of the potato should be abolished. I feel and *know* it is perhaps one of the most productive and useful crops that can be grown, and therefore I conceive it behoves us all to use every means in our power to check and destroy the disease which has so long spread misery in this country (Hear, hear). I plant in ridges, or lazy beds, five feet wide, whenever possible in November; if not, as early as I can after. My seed is whole, about the size of, or smaller than a walnut; each placed 12 inches apart, and on each set a *handful of peat charcoal*. (Hear, hear, and cheers). They tell me at Robertstown, "it does their hearts good" to eat the potatoes—they are so mealy and dry. They say, "they would rather have one of them than an apple;" and I believe them. (Hear, and laughter). In fact, they are dry and sound; and so will yours be, if you plant in the same way; and you have no excuse if you don't, for you can now easily get the charcoal. (Hear, hear.) I will shortly explain the property of the charcoal —first, when put on the seed, if it is wet and inclined to rot, the charcoal absorbs the water and checks the disease; then, the rain that falls gives to the charcoal ammonia and salts, which are the best manure the potatoes can have; and, in addition to the charcoal, when the potato begins to grow, the charcoal, which surrounds all the little roots, is constantly supplying them with the ammonia and the salts and its own carbon (which it gives abundantly), whilst all the time it is collecting more and more *ammonia and salts*, and storing it for the potato till it wants it, and takes it in by the roots. This goes on continuously. But, if your land is very poor, you must save *all that comes out of your cabins*, and use it with the charcoal; don't let any be lost; and I tell you it will be a better manure than *guano*. Use this in the same way, and you will say I am right (Hear, hear). In fact, use it for any crop, and you will find it is beneficial to all (Hear, and cheers).

A vote of thanks to Mr. Rogers having been proposed by the Rector, and seconded by the Priest of the parish, the cheering continued for several minutes; when Mr. R., in a few apparently heartfelt words, expressed his obligation and the happiness he then felt.

A committee was then formed, with the chairman of the meeting at its head, to communicate with the Marquis of Downshire, and make such other arrangements as were necessary with the object of subscribing for such shares as were required for the purpose of establishing AN IRISH AMELIORATION SOCIETY'S STATION AT EDENDERRY.

BIRMINGHAM, 1ST MONTH, 29TH, 1851.

In taking a brief review of the corn trade, during the past year, it will be seen that the highest general average price of Wheat per qr. for the United Kingdom was 44s. 1d. for the week ending August 12th, and the lowest 36s. 11d. for that ending May 6th, being a difference of 7s. 2d. per qr.; while the highest average for Birmingham was 45s. 2d., and the lowest, 37s. 10d. These fluctuations are small compared with many former years, under a system of monopoly.

Notwithstanding the deficiency of the crop in some parts of the kingdom, especially in the eastern counties, it will be seen that the aggregate average price of Wheat for England and Wales, in 1850, was 4s. 2d. per qr. lower than in 1849, the former being 40s. 4d., and the latter 44s. 6d.; and this depression existed concurrently with a high relative price of meat and potatoes, and the stimulus given to consumption by the generally prosperous condition of the working classes. The circumstances which have mainly contributed to produce this result, are, we believe, a better yield of Wheat than was anticipated in the midland and southern districts of this kingdom; a heavy crop in France, which enabled exporters from thence to supply us largely with both Wheat and Flour, the latter being of superior quality; and a greater import from the other corn-growing districts of Europe and America than was expected.

The general impression immediately after harvest that our Wheat crop was below an average, led to some heavy shipments from the Baltic, the United States, the Mediterranean, and the Black Sea, which have occasioned serious losses to the parties interested. These supplies would probably have produced a still greater depression had not a constant, large, and increasing demand for Ireland absorbed so considerable a portion of the imports. In addition to the direct arrivals in the Irish ports, it is estimated that out of about 650,000 qrs. of Black Sea Wheat, which was addressed to Queenstown and Falmouth for orders during the last six months of 1850, nearly 400,000 qrs. were taken on Irish account; and although some quantity, particularly of the inferior qualities, is still in warehouse there, yet by far the greater proportion has gone into consumption. Our imports, however, of foreign Wheat, Flour, and Meal, in 1850, were only 12,227 qrs. greater than in 1849; yet the stock in warehouses at the end of last year is estimated at about one-third more than at the same period in 1849. Even with the increased facilities of communication, and the wide circle from which supplies are drawn under a system of free trade, we certainly did not anticipate at the commencement of last year that our prices would rule quite so low as they have done; and we should infer from this experience that when England is the only country requiring a large import of Wheat, our farmers cannot safely calculate upon obtaining much beyond 40s. per qr. for Wheat. This state of things must, however, be considered the exception, not the rule; France especially has on an average of seasons been an importing instead of an exporting country of Wheat; and with an increasing population, whose leading article of food is bread, we may reasonably calculate upon her reverting to her former position. It is probable the crop of Wheat in France will in future have more effect upon our prices than that of any other country.

We have no data upon which to form an opinion with any degree of confidence as to the range of prices between the present time and harvest: we do not under any circumstances expect much further reduction; and we are not sanguine of a considerable advance upon our present quotations, if the appearance of the growing crop continue favourable, and there should be no revival of the spirit of speculation in grain; and although generally there must continue to be a loss on imports, without a material reduction in prices abroad, or an advance here, this will not, we believe, prevent a considerable quantity of foreign Wheat finding its way to Great Britain during the spring and summer, which will be sold at a market value without reference to its cost. It will be seen from the annexed tables that the average price of Wheat in 1850 was much below that in any year during the present century, except in 1835, when it was less by 1s. per qr.; and the average value last year of all other grain is lower than it has been for at least a quarter of a century.

The price of Barley was very low during the spring, and for some time good grinding qualities barely realised 17s. per qr.; but from this point there has been an advance of about 5s. per qr.: there is a material falling off in the import of this grain compared with 1849; and we think the stock in England is lighter than is usually the case at this season of the year.

Oats, we believe, proved an average crop, but in some parts of Ireland they were reported to be deficient. At the lowest point since harvest, good Irish white Oats have with us been worth only 17s. per qr.; subsequently they have advanced 2s. to 3s. per qr., with light imports, but quite equal to the demand; the supplies of English in this quarter having for some time been liberal.

The crop of Beans in England was probably one-third short of an average in 1850, but the quantity held over harvest of the previous year's growth was large. Our supplies from France and Egypt have also been considerable, and they have not borne a relative value even to Oats, though the consumption for pig-feeding in the autumn was great.

Peas were nearly as deficient as beans, but this had little effect on prices, and the supply was fully equal to the demand.

The imports of Indian Corn and Rye into Ireland have only amounted to about half what they did in 1849; while it is estimated that the imports of Wheat and Flour in 1850 were nearly double those of 1849, showing the power of the remaining population of that country to take a larger proportion of a better description of food.

JOSEPH AND CHARLES STURGE.

AN ACCOUNT OF THE CORN, MEAL, AND FLOUR, IMPORTED INTO GREAT BRITAIN IN EACH YEAR, FROM 1ST JAN. 1815, TO 1850.

Year.	Imported from Ireland.	Imported from the British N. American Colonies.	Imported from all other parts.	Total imported.
	Qrs.	Qrs.	Qrs.	Qrs.
1815......	821192	25	333041	1154258
1816......	873865	3	319203	1193071
1817......	695651	25877	1775353	2496881
1818......	1204733	56618	3474051	4735402
1819......	967680	14257	1693255	2675192
1820......	1415722	40897	1300953	2757572
1821......	1822816	40916	216738	2080470
1822......	1063089	23439	102365	1188893
1823......	1528153	209	53432	1581794
1824......	1634000	891	609147	2244038
1825......	2203962	95059	962718	3261739
1826......	1693392	30500	2218830	3942722
1827......	2828460	61035	2550310	5439805
1828......	2826590	21600	1272396	4120586
1829......	2307244	7335	2680414	4994993
1830......	2215521	79634	2355412	4650567
1831......	2429182	225240	3316760	5971182
1832......	2990767	129476	668422	3788665
1833......	2737441	117745	336524	3191710
1834......	2792658	66829	492071	3351558
1835......	2679438	25016	296189	3000643
1836......	2958272	18561	625032	3601865
1837......	3030293	19060	1306870	4356223
1838......	3474302	19479	1515250	5009031
1839......	2243151	17438	4573660	6834249
1840......	2327782	178828	3811694	6318304
1841......	2855525	308382	3378599	6542506
1842......	2083600	247127	3475970	5806697
1843......	2721400	146647	1299776	4167823
1844......	2460800	297926	2794357	5583083
1845......	2992800	312438	2118707	5423945
1846......	1625000	431075	4480302	6536777
1847......	879900	546431	11769728	13196059
1848......	1827000	229313	7125688	9182338
1849......	1175000	210510	10616338	12001848
1850......	1212500	126533	9134220	10473253

PRICES OF GRAIN IN FOREIGN PARTS, PER QUARTER, IN 1849 AND 1850, MOSTLY TAKEN IN DECEMBER.

	WHEAT—1849.					WHEAT—1850.				
	s.	d.		s.	d.	s.	d.		s.	d.
Dantzic............	35	0	to	40	0	34	0	to	40	0
Do. high-mixed......	38	0	..	44	0	40	0	..	45	0
Leghorn	36	0	..	49	0	26	10	..	46	4
Rostock............	35	0	..	37	0	37	0	..	40	0
Trieste	32	0	..	41	0	24	0	..	33	0
Hamburg	34	0	..	40	0	36	0	..	40	0
Petersburg	33	0	..	38	0	32	0	..	34	0
Genoa	38	0	..	39	0	26	6	..	35	0
Naples	36	0	..	40	0	30	6	..	33	0
Konigsberg	33	0	..	40	0	35	0	..	40	0
Bordeaux	35	0	..	40	0	36	0	..	37	6
Marseilles..........	33	0	..	36	0	29	0	..	33	0
Nantes	34	0	..	36	0	34	0	..	37	0
Odessa	25	3	..	31	10	24	2	..	30	10
Ancona............	31	0	..	32	0	31	0	..	32	0
Stettin	34	0	..	36	0	35	6	..	38	0
Bilboa	34	0	..	38	0	35	0	..	39	0
Galatz	21	0	..	26	0	19	1	..	24	6
New York..........	38	0	..	42	0	31	2	..	41	9
Philadelphia........	34	0	..	39	0	32	0	..	36	0
Montreal	31	0	..	34	0	30	0	..	36	0
Taganrog	26	0	..	33	0	28	2	..	29	6
Alexandria	16	9	..	18	0	16	0	..	17	9
Constantinople......	26	0	..	35	0	21	0	..	24	0
Archangel..........	25	0	..	27	0	25	0	..	27	0

AN ACCOUNT OF THE TOTAL QUANTITY OF WHEAT AND WHEAT FLOUR IMPORTED INTO GREAT BRITAIN FROM IRELAND FROM 1801 TO 1825.

Year.	Qrs.	Year.	Qrs.
1801..........	150	1814..........	225,478
1802..........	108,751	1815..........	189,544
1803..........	61,267	1816..........	121,631
1804..........	70,071	1817..........	55,481
1805..........	84,087	1818..........	105,179
1806..........	102,276	1819..........	153,850
1807..........	44,900	1820..........	403,407
1808..........	43,497	1821..........	569,700
1809..........	66,944	1822..........	463,004
1810..........	126,388	1823..........	400,068
1811..........	147,245	1824..........	356,384
1812..........	158,352	1825..........	396,018
1813..........	217,154		

ACCOUNT OF THE FOREIGN CORN, GRAIN, MEAL, AND FLOUR, IMPORTED INTO GREAT BRITAIN AND IRELAND, IN THE YEARS 1827 TO 1850.

	Wheat.	Barley and Bigg.	Oats.	Beans.	Peas.	Rye.	Buck Wheat.	In. Corn, or Maize.	Flour and Meal.		
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Cwt.	qrs.	lbs.
1827..	283236	208117	1741091	142726	34694	30413	9392	154097	94348	0	24
1828..	715242	168673	166423	73370	52928	29562	29036	19649	151038	3	8
1829..	1544969	305798	541858	46487	40412	67392	18400	27022	461895	0	25
1830..	1414262	132210	499947	16909	34572	44784		1031	560249	3	2
1831..	1857278	369032	617568	22345	59507	93006	6521	59232	1627742	1	0
1832..	405884	101810	31862	27914	20198	4645		1582	224068	3	0
1833..	247625	85221	23335	22857	15890	3370	33	7	170092	3	14
1834..	131566	88562	175266	47756	67880	10	1	227	149554	2	14
1835..	46530	67796	117673	34380	24216	21	210	1808	84684	2	16
1836 .	162778	83483	129625	93056	78299	6626	440	1006	279692	2	13
1837..	452369	87791	413710	105671	111264	30711	471	4026	346325	3	18
1838..	1240138	2203	50981	64358	29848	1781		4043	439910	2	11
1839..	2638593	579405	674554	109810	140112	153673	1936	9565	793606	1	6
1840..	1995455	625437	537805	129418	158486	3332	765	22021	1552697	1	17
1841..	2409754	264654	122297	293689	148564	15600	3	4137	1275656	0	0
1842..	2722305	73550	302852	126591	93239	13823	9	35866	1151827	0	0
1843..	932866	179414	84718	48080	48971	4872		516	440955	3	23
1844..	1097963	1025416	308126	153724	108056	26594	3935	39218	987774	3	2
1845..	844533	367854	586860	185008	86613	435	1771	55984	924256	2	26
1846..	1437336	371137	794863	255521	212529	1688	22849	694184	3363810	0	0
1847..	2650058	772840	1706780	443719	157245	68817	22938	3614637	8637377	1	0
1848..	2477366	977203	930265	480706	187454	59825	205	1577023	1731974	0	24
1849..	3872568	1388494	1281517	456023	236067	241613	307	2189164	3483294	0	0
1850..	3754592	1043051	1165876	443306	181419	94078	296½	1286263	3855058	0	25

THE QUANTITY OF CORN, MEAL, AND FLOUR, IMPORTED INTO GREAT BRITAIN FROM IRELAND, IN THE YEARS 1826 TO 1850.

Year	Wheat.	Oats.	Barley.	Beans and Peas.	Malt.	Oatmeal	Wheat Flour.
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Cwt.	Cwt.
1826	241925	1179896	64885	8642	1203	194602	255240
1827	468820	1946339	67791	11319	572	438966	618313
1828	474994	1805336	84204	11894	853	424749	621569
1829	340084	1417729	97140	14879	2011	402127	626268
1830	337641	1226486	189745	21573	2820		672265
1831	407714	1286254	185409	19171	10888	581371	524318
1832	552740	1662786	123639	16445	8220	611412	831434
1833	541475	1353533	101767	21760	7017	642692	1059587
1834	462229	1277598	217855	20947	3865	772994	1110463
1835	340535	1462581	156242	27682	10357	566006	1124343
1836	249360	1627324	184156	20524	22214	675470	1169200
1837	252720	1634720	187473	25690	4174	1004370	982990
1838	209600	1946050	156467	26816	5001	1252741	1168195
1839	90600	1290000	61676	13019	2861	877000	519000
1840	92990	1397500	95954	15976	3456	989500	280700
1841	113225	1667542	75568	16762	4935	1357321	333183
1842	112400	1275200	50200	21450	3050	1549500	313500
1843	191700	1559500	109650	25500	8600	1705300	773100
1844	200200	1509000	90700	19600	8000	1150000	839000
1845	371000	1678000	92000	14300	11000	1058000	1421000
1846	187300	956000	93000	17000	11000	554000	725000
1847	125700	493000	47500	27000	6500	330500	211000
1848	146000	1081000	79700	14700	6300	936000	561000
1849	94500	652000	43500	24600	5000	672000	393500
1850	76000	642400	51000	20400	19500	786000	397300

CORN, MEAL, AND FLOUR IMPORTED, ENTERED FOR HOME CONSUMPTION, AND PAID DUTY SINCE 1823 INCLUSIVE, THE FIRST YEAR IT WAS LEVIED ON CORN.

Year.	Qrs. Imported.	Qrs. for Home Consumption.	Duty Paid.		
1823......	53866	12362	£10310	4	3
1824......	612594	677195	176383	15	6
1825......	1060837	834425	304919	15	5
1826......	2252271	2098944	442755	14	9
1827......	2622283	2998866	792934	15	8
1828......	1294378	1237494	196255	0	0
1829......	2694432	1959355	898794	0	0
1830......	2691884	2649348	790110	0	0
1831......	3570569	2265392	544792	0	0
1832......	668422	475680	307987	0	0
1833......	481506	112408	35284	0	0
1834......	560056	236902	97984	0	0
1835......	321206	439988	234572	0	0
1836......	643592	408217	149660	0	0
1837......	1325930	842326	583269	0	0
1838......	1534730	1960475	186758	0	0
1839......	4591099	4657146	1098857	0	0
1840......	3990522	3903518	1156658	0	0
1841......	3686982	3375504	568339	0	0
1842......	3723097	3543426	1363982	0	0
1843......	1446423	1372315	758322	0	0
1844......	3092293	2778591	1098387	0	0
1845......	2431145	1552850	367022	0	0
1846......	4911377	5466963	786807	0	0
1847......	12257558	12746641	13960	0	0
1848......	7355001	6368417	789785	0	0
1849......	10826848	12003164	617000	0	0
1850......	9260753	9293385	472900	0	0

AVERAGE PRICE OF GRAIN PER QUARTER IN ENGLAND AND WALES, FOR TWENTY-FIVE YEARS ENDING 1850, AND WHEAT SINCE 1799.

Year.	Wheat.		Year.	Wheat.		Barley.		Oats.		Beans.		Peas.	
	s.	d.		s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
1799..	66	11	1825..	68	7								
1800..	110	5	1826..	58	9	34	5	26	9	44	3	47	8
1801..	115	11	1827..	56	9	36	6	27	4	47	7	47	7
1802..	67	9	1828..	60	5	32	10	22	6	38	4	40	6
1803..	57	1	1829..	66	3	32	6	22	9	36	8	36	8
1804..	60	5	1830..	64	3	32	7	24	5	36	1	39	2
1805..	87	1	1831..	66	4	38	0	25	4	39	10	41	11
1806..	76	9	1832..	58	8	33	1	20	5	36	5	37	0
1807..	73	1	1833..	52	11	27	6	18	5	35	1	37	0
1808..	78	11	1834..	46	2	29	0	20	11	36	7	33	0
1809..	94	5	1835..	39	4	29	11	22	0	30	0	30	3
1810..	103	3	1836..	48	9	33	2	23	1	38	4	37	3
1811..	92	5	1837..	55	10	30	4	23	1	38	7	37	9
1812..	122	8	1838..	64	4	31	5	22	5	37	4	36	8
1813..	106	6	1839..	70	6	39	1	26	6	41	3	41	1
1814..	72	1	1840..	66	4	36	3	25	9	43	6	42	5
1815..	63	8	1841..	64	5	33	0	22	5	39	1	40	5
1816..	76	2	1842..	57	5	27	6	19	3	32	8	32	11
1817..	94	0	1843..	50	2	29	5	18	3	29	1	31	1
1818..	83	8	1844..	51	3	33	7	20	7	34	6	33	5
1819..	72	3	1845..	50	9	31	8	22	6	39	0	38	6
1820..	67	11	1846..	54	9	32	9	23	8	39	0	39	0
1821..	56	2	1847..	69	5	43	11	28	7	50	1	51	5
1822..	44	7	1848..	50	6	31	6	20	6	36	9	39	1
1823..	53	5	1849..	44	6	27	9	17	6	30	3	31	3
1824..	64	0	1850..	40	4	23	5	16	5	26	11	27	5

LAWES *v.* PURSER.—INFRINGEMENT OF PATENTS.

A cause was tried before the Chief Baron at the Guildhall, in the city of London, on the 22nd December last, of which we give a brief report, involving a question of deep interest to the cultivators of the soil; but to which little attention has been as yet directed. The action was brought by Mr. Lawes, of Rothampsted, Herts, against Mr. Purser, of New Bridge-street, Blackfriars, as Secretary of the London Manure Company, for the infringement of certain patents belonging to Mr. Lawes. Professor Henslow, one of the witnesses, having occasion to advert to a remark which he made upon the subject at the Ipswich Museum dinner, writes as follows in a letter addressed to the Editor of the *Suffolk Chronicle*:—

"In reporting a remark of mine at the Museum dinner, at Ipswich, last week, a mistake has been made which I shall be glad to rectify. I was supposed to have said I had received a subpœna to attend a trial in which the sum of £7,000 was involved, in respect of the nodules, commonly called 'coprolites,' found in the neighbourhood of Felixstow. It will be seen, by the sequel, that I must have said '£7,000 per annum.' The trial to which I referred was brought to an issue last Monday, and the verdict was adverse to the claims of the plaintiff, who had taken out a patent, in 1842, for the manufacture of superphosphate of lime, by applying sulphuric acid to whatever description of mineral (known or unknown) might contain the phosphate. A host of witnesses were subpœned, and among them I recognized at least seven Professors in chemistry, geology, anatomy, &c. Considering the pains that had been taken with this case, and the great expense to which the opposing parties had been put themselves, it seems to me strange that the newspapers of the following day should merely have stated that 'the Exchequer Court had been occupied all day with a *patent case* which contained nothing of sufficient interest to be reported.' I venture to believe the case will prove to have been one of interest to some of the landed proprietors of East Suffolk, and possibly some in Essex also, who happen to possess property on the red crag formation. I also think it is a case which might be adduced with success against some of the absurdities of our patent laws."

"Feeling myself much honoured by the confidence of those who have elected me President of the Ipswich Museum, I shall be glad if I can point out anything that may be taken as an earnest of my desire to assist in carrying out the objects for which the Museum has been founded. The diffusion of a little knowledge respecting the phosphate nodules of the crag may be considered of this character. In company with seven gentlemen, who had been attending the anniversary last week, I visited the 'diggings' at Felixstow; and from what I then observed, in addition to what I before knew of the positions of the phosphate nodules in the crag, I feel strongly inclined to believe they will be found (here and there) dispersed over a very extended area. It is more than two years since I visited the locality, in company with Dr. Daubeny, the chemical professor at Oxford; and until then I had not been to the spot since I had communicated, through the *Bury Post*, in 1845, what I had previously observed of the abundance of these materials in that locality. We saw 1000 tons of the nodules lying in a heap in the field, from which another 1000 tons had been previously extracted only a short time before. I had no opportunity at that time of remarking the exact position of the bed in which the nodules lay. I now find that they lie in patches immediately above a continuously abraded surface of the London clay, and consequently beneath the general mass of the red crag. The fact of their being slightly rolled, as well as mineralogically altered from the condition in which they were originally formed in the London clay, has been noticed in a report of the proceedings of the British Association at their meeting in Oxford, in 1846; but I had not then observed that they were so specially located at the bottom of the crag. This is a fact of considerable geological interest, and, I think I may add, likely to prove of some advantage to those who possess property in the crag."

The supply of these phosphate nodules is not confined to Suffolk, but will be found in other parts of the kingdom. We have it also upon the authority of Professor Henslow that "the extent to which the nodules have already been raised is enormous," and in proof of their value in the manufacture of superphosphate of lime, he says—

"Hitherto, I understand, the demand has exceeded the supply; but the extent to which I am inclined to believe they may yet be procured is a hundredfold greater than I had ever before supposed to have been likely. It may afford some idea of the importance of these 'diggings,' when I state that I have been assured by those who appear to have possessed excellent opportunities of knowing the fact, that £10,000 per annum is within the income which has recently been derived from the sale of phosphate of lime obtained from the 'diggings.'"

The manufacture of superphosphate of lime by the application of sulphuric acid to bones may be considered as the most successful result of the aid of science to agriculture. This discovery would inevitably lead to a vastly increased demand for bones, of which the supply must necessarily be limited; fortunately, however, it was discovered that these phosphate nodules, or coprolites, as they are commonly called, contained phosphate of lime in sufficient quantity to form a valuable substitute for bones in the manufacture of superphosphate of lime by a similar application of sulphuric acid. Mr. Lawes having his attention directed to the use of various manures in the course of his experiments, obtained patents in which he claimed as a novelty the formation of superphosphate of lime, by means of sulphuric acid, from bone-dust, bone-ash, and mineral phosphates, in its application to agriculture, thereby claiming the full and entire benefit which would result from a monopoly of the manufacture of superphosphate from these articles. The first patents were taken out in 1842, the last patent in 1846. In course of time, Mr. Lawes discovered that the application of sulphuric acid to "bones" and "bone-dust" was already known; and hence, in 1848, he entered a disclaimer, so far as regarded that part of his patent. The patent having been found inoperative on these points, the great object was to secure a monopoly of the use of the "mineral phosphates"—the "coprolites." To this monopoly Mr. Purser was not disposed to quietly submit, and hence his determination to make use of the "coprolites," despite Mr. Lawes's patent. In reading the report of the proceedings at the trial, and looking to the peculiar phraseology of the patents, it is impossible to avoid the inference that the language employed has been purposely made as general and as comprehensive as possible from the want of facts to make it specific—a sort of sporting patent, which might be sufficient to stop the superficial inquirer, but would not bear the test of a searching examination; and the Chief Baron seems to have been of this opinion, as will be seen by the following extract from his charge to the jury:—

> "My ground for thinking that the first patent is not sustainable is this: that it turns out *now* that the process of getting the superphosphate of lime from bones, and crushed bones, was perfectly well known. Well, then, the present plaintiff has merely done this: he has discovered that the same thing may be done from *burnt* bones, and the same thing may be done with *apatite*. I think considerable doubt might have been entertained whether the patent would have been good if it had been limited to burnt bones, or had been limited to *apatite*; for, after all, according to the chemists, you get the identical substance that you used before, without the slightest shadow of variation. But the claim to exclude the public from any further experiments, or any further use of anything else under heaven that contains these substances, seems to me very much too large in point of law, and one that cannot be sustained. It arises out of that which we very often find, and which I lament very much when I do find it—the endeavour to spread your net so wide that it breaks, and then you catch nothing; an unfortunate circumstance to arise, but I am sorry to say it appears to me it has arrived here. On the second patent I think in the same way; that grasps at too much, but it contains nothing definite. No man, even a chemist, taking the second patent, in my judgment (as it appears to me) if that is good, could make anything. The claim is this: without telling any person any particular substance; any particular acid; any particular mode of dealing with it; he claims, as it were, the principle of taking *any* acid, mixing it with *any* alkali, and throwing in any sort of absorbent or dry matter, like sawdust, earth, sand, and so on; he claims that under *any* circumstances, with *any* acid, and *any* alkali, and in *any* proportions of *any* kind whatever. Very much too large a claim, because, in taking care to give to those who really benefit mankind by distinct, specific, beneficial discoveries, one must also take care that the law of patents is not made the means of preventing useful enquiry and research, and stopping the labour of others. By the grasping and taking to a supposed inventor discoveries that he never dreamt of or thought of; instead of advancing the cause of science and useful industry, it is in reality closing up the door to future discovery, and enabling the supposed patentee to claim and take to himself much for which he never laboured at all."

Regarded as a mere contest between Messrs. Lawes and Purser, this case would possess little public interest; there is, however, a much larger question involved, namely, the free and uninterrupted use by the agriculturist of these "coprolites" and other "mineral phosphates" in the manufacture of a manure of the most valuable character. At this particular period it is of the utmost importance that the cultivator of the soil should be enabled to avail himself of every appliance within his reach, and we hold that the agricultural interest is deeply indebted to Mr. Purser for the successful stand he has made against an attempt to grasp from them an important advantage. There are few men who would have had the firmness and determination to risk the heavy costs which the defeat in this action would have involved, as Mr. Purser has done, the more especially when it is borne in mind that he has *not contested this question for his own individual benefit*. Had the question been whether he or Mr. Lawes should have monopolised the seven or ten thousand per annum alluded to by Professor Henslow, the affair would have worn a different aspect. In fighting this battle, Mr. Purser has secured to *all* the privilege which he sought for himself, and we trust the parties most interested in the question will adopt some substantial mode of manifesting their sense of the truly liberal spirit he has displayed.—Mark Lane Express.

THE GREAT COPROLITE CASE.

LAWES *v.* THE LONDON MANURE COMPANY.

This cause was tried on Monday the 22nd December last, in the Court of Exchequer, at Guildhall, before Chief Baron Pollock, and a special jury. Mr. Crowder, Mr. Butt, and Mr. Groves, conducted the plaintiff's case; Sir F. Thesiger, Mr. M. Smith, Mr. Cuthbert Johnson, and Mr. Aspland, that of the defendants. This action was brought on two patents granted, the first to the plaintiff on the 23rd of May, 1842, and the second *on the same day* to Sir J. Murray (afterwards purchased by the plaintiff), for, amongst other things, the manufacture, for the purpose of manure, of superphosphate of lime (by means of sulphuric acid) from phosphate of lime, from whatever source this salt or bone earth is obtained. Soon after the specifications were enrolled, however, the plaintiff discovered that superphosphate of lime made from bones had been successfully used as a manure by the members of the Morayshire Farmers' Club, and other farmers, previous to the date of the patents; he therefore entered a disclaimer as to that portion of his specification which related to the claim to the exclusive use of recent bones, and the only question in fact which was raised at the trial was whether the claim of Mr. Lawes could be supported to the exclusive use of the native phosphate of lime or *fossil* bone in the preparation of the superphosphate of lime. The defendants resisted this claim on the ground that—First, the plaintiff had no equity; that he had neither discovered the superphosphate of lime or its use as a manure, or that it could be made from any phosphate of lime, however or wherever obtained: all these facts being well known long before the patents were granted; but that moreover some years elapsed after the date of the patents before the coprolites or fossil bones (which they had used) were discovered, not by Mr. Lawes indeed, but by Professor Henslow, who in fact *then* first taught the plaintiff where they were to be obtained. 2ndly, they raised several fatal legal objections to the patents; about which, however, they were evidently less anxious than upon the real merits of the case. It does indeed seem very odd, not to say very improbable, that two gentlemen, the one seated in Hertfordshire, the other at Dublin, should on the very same day both *invent* the *very same thing*, viz., the manure superphosphate of lime, and both claim the sole use for this purpose of the native phosphate of lime, called by mineralogists "the apatite, or phosphorite." This simultaneous discovery would, standing by itself, appear very improbable indeed; but the marvel did not, in this case, end here, for both Mr. Lawes and Sir J. Murray on the same day discovered as manures, secondly, the alkaline phosphates!! thirdly, the silicates of potash and soda!!! Thus both these gentlemen made the discovery, it seems, at the same time, of three different manures; and both obtained patents on May 23rd, 1842, for these three identical discoveries. What can the reader think of such a marvellous and previously unheard-of identity in original thought and time? If the reader, however, will only turn to the valuable work of Liebig on Agricultural Chemistry, published only a few months *before* the *date* of these two patents, he will be rather surprised to find that, 1st, superphosphate of lime is there especially recommended as a manure; 2nd, the alkaline phosphates; 3rd, the use of silicate of potash. These claims were firmly and successfully resisted by the London Manure Company, who contended that they were not indebted to the plaintiff for any knowledge whatever. The jury, under his lordship's direction, found a verdict for the defendant; Mr. Crowder tendering a bill of exception to his lordship's directions.

We think and trust that the expenses of these legal proceedings will not be allowed to fall exclusively upon the eminent company who have thus fearlessly conducted this expensive case.

OXFORD FARMERS' CLUB.

At the monthly meeting of this club, held at the Roebuck Hotel, the Vice-President, Mr. Thompson, of Culham, having at a former meeting moved the adjournment of the discussion on the blight of wheat, re-opened the subject. He stated that it was proposed to discuss the question as to what was the cause of the black blight, as it was commonly called. Speaking from his own experience, the black blight developed itself soonest, and in the most virulent form, on the finest land, and on that which was in the highest state of cultivation. Wherever the haulm or straw was rankly luxuriant, there did the blight most certainly appear; rankness of vegetation, then, it would seem, was one cause of this disease, and this favoured by a moist season, or by a low and dull exposure, was generally recognised as all that was necessary to produce the disease. It appeared, to him, that this blight was a consequence of the deposition of the seed of a fungus, favoured by the state of the plant. They were all aware that the atmosphere held in suspension, at all times, myriads of the seeds of this class of plants; nothing, indeed, of any kind, ever appeared to become fitted for their vegetation that was not instantly supplied with the seeds in quantity and variety almost beyond conception. As a general rule, all kinds of manure which excited a rapid and luxuriant growth, assisted by a moist, warm atmosphere, when the plant was in a certain stage, favoured the attacks of blight (much applause).

Mr. **John Harris**, of Hinton, stated that he had found, from 30 years' experience, that the blight was most severe where there were barberry bushes in the hedge-rows, and mentioned several instances in his own neighbourhood in support of that opinion. He also stated that he knew cases where the barberry bushes had been grubbed where the blight prevailed, and that after that it had not developed itself. And he mentioned as a further illustration, that his friend, Mr. Edmonds, made a wager that he would cut a barberry bush, and place it among the wheat, and that blight would follow, which was the case, and in consequence he won his wager.

Mr. M. **Tagg**, of Elsfield, adverted to hedgerows being equally injurious with barberry bushes. He also concurred with the observations that in a luxuriant crop the blight was more likely to develop itself.

Mr. **Middleton**, of Cutslow, was of opinion that blight was a visitation of Providence, which could not be prevented by any counteracting influence of human invention; and although barberry bushes were assigned by some to be the cause, yet it carried little weight, because blight was seen in crops where there was not a barberry bush within 20 miles. He still thought, however, that much of the evil might be abated by keeping the hedgerows as low as possible, and prevailing on the landlord to knock down as much of the timber as possible, for he was firmly of opinion that high hedgerows and timber were equally bad for the cultivation of the crop.

Mr. **Joseph Gillett**, of Haseley, was of opinion that there were many causes of blight, such as the cultivation of the land, want of solidity, and draining. There was no question that the cultivation of the land was an important feature in it, because if they made the land as rich as a dungmine, they would produce blight, and attract blight. In highly-cultivated land, and where the wheat was the most luxuriant, the blight was the most likely to develop itself; and this was an answer to those theorists who preached high farming, for those who practised it found they obtained less produce. Where the land was the least cultivated, there they oftentimes found the kindest wheat; and he had observed in the neighbourhood of Wycombe, where the land was in an inferior state of cultivation, they were free from the blight. He believed, too, that porous land was more subject to the blight, because it produced the fungus, and was more susceptible of blight than land which was more solid. On a porous soil he had ploughed bean stubble with horses, and afterwards found the blight, and he fancied that a corrective, with a view to obtain solidity, would be by breast-ploughing; in consequence of that he had not since then put a horse-plough on bean stubble, but had used the breast-plough, which he found corrected the blight. If people would adopt the system of breast-ploughing and good draining, he was satisfied in his own mind that they might obviate the blight in many seasons. It was true that blight might arise from atmospheric causes, but he was satisfied, from his own experience, that the solidity of the land had a great deal to do with it. He also attributed the blight to thin sowing, and to overgrown timber and hedgerows, which should be done away with, for he knew the advantage of so doing, having about 480 acres, which were thrown open, and without a hedge-row or timber upon the whole. All their attempts, however, would not remove the cause of blight, because there were agencies at work over which they had no control. If they wished to cultivate land successfully, they should first ascertain what the land was capable of bearing, and be guided by their own judgment, and that of their neighbours, instead of listening to a parcel of theorists, who knew nothing of the locality, or the peculiarities of the soil. It was necessary, also, that the farmer should consider well what he was about, and not get his land into too high a state of cultivation, if he desired to obtain good crops. He gave the President great credit for bringing this subject before the club; but, at the same time, he thought they would do little good, even if they could correct the blight in wheat, unless at the same time they could correct the blight in prices; and he thought that the subject to which they should all turn their attention was how they could obtain a fair remunerating price for their produce (loud cheers).

Mr. **Watson**, of Garsington, remarked that he knew nothing of the blight until he came into this neighbourhood. He had farmed in the counties of Nottingham and Leicester for 20 years, and during the whole of that time he never knew what blight was; but before he had been in this county two years he not only found out what it was, but also felt the consequences of it. He thought that it originated from the mode of cultivating the land, and that there were other causes, such as atmospheric causes, over-cultivating, over-ploughing, and getting the land into too light a state. In other counties, where they did not pay so much attention to farming and feeding off sheep, they knew nothing of the blight; but here the best-cultivated land was the most subject to it.

Mr. **Long**, of Farm Moor, observed that he had noticed a great deficiency in the yield of wheat where there was no blight visible. He had one-third deficiency of yield, and attributed it to the high winds, and made the remark at the time that he feared it would be so. He had a piece of wheat in which there had been the blight, and he attributed it to the wheat not suiting the soil. There was a great difference in the soils, and some wheats were more subject to blight than others, and therefore it was the duty of every one to select such wheats as were not subject to it, and he did not hesitate to say that he had, from experience, found the Spalding wheat freer from it than any other.

Mr. J. **Orpwood**, of Waterperry, said he had suffered both from blight and a deficiency of crop; but the wheat which suffered from blight was sown the last, and he attributed it to its being late planted.

The **President** moved the following resolution, which embraced the views of those who had spoken on the question:—"That a proper cultivation of the land, and obtaining solidity, draining, sufficiency of seed, removal of the hedge-rows and hedge-row timber, thus admitting a free circulation of air, would contribute materially to prevent blight."

The resolution was carried unanimously.

The **President** stated that his reason for introducing the question of the blight of wheat was solely owing to his anticipating a great deficiency in its yield, which, he regretted to find, was the case to a very serious extent.—Abridged from the Oxford Journal.

FIELD CULTIVATION OF THE JERUSALEM ARTICHOKE.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

Sir,—In an article on the Jerusalem artichoke, in the *Farmers' Magazine* for January, I did not think it necessary to enter into any details regarding the best method of cultivating it, thinking it sufficient to state that it should be cultivated from first to last as the larger and coarser varieties of the plants. Indeed, I hardly thought myself entitled to lay down my own method as the one that should be uniformly followed. I preferred leaving growers to pursue their own theories, according to their soil and climate, &c.; and I must say that I still think that, whatever is the customary method of planting and managing field potatoes in any particular district, that will there be found the best method of treating the Jerusalem artichoke. As, however, I have been favoured with warm inquiries on this head, and the subject seems to have created much interest, the subjoined particulars will perhaps be a satisfaction to some of your readers.

The time of planting is from November to Lady Day. The earlier perhaps the better, if the ground be in good order. But March crops will do very well. Much, of course, depends upon soil, climate, season, &c.

The mode of propagation is by small bulbs or cuttings of large ones, one or two eyes—not more—being left in each set. Sets weighing an ounce will be large enough. These may be planted in rows, 27 inches apart (in ground of average quality), and at 18 inches apart in the rows, and say 4 inches deep—not more; the artichoke, as far as I have had opportunity of judging, not throwing its tubers so much to the surface as the potato. If planted in the above manner, and the sets do not generally exceed* an ounce in weight, 10 cwt. will, of course, be ample seed for an acre. They may be ploughed in, set with the dibble, or planted in any other way that may suit the nature of the soil and the theory of the grower—in as many ways, in fact, as the potato.

They will appear above ground in the month of May. They must then, and subsequently, have the same treatment, be stirred, flat-hoed, round-hoed, as the potato. It is, however, to be observed that from thin shallow-planting they must, in due course, be round-hoed; and, again, that there appears some doubt whether they will bear the "lift"† given to the potato in the first flat-hoeing. In other respects, the more the ground is stirred the better, and the treatment best for the potato will be found best for the Jerusalem artichoke. The tubers will be ripe as soon as the stalks—which must not be previously cut down—are dead. This will be about the first week in November. The crop may then be raised in dry weather any time before the end of February. In good ground, where the tubers will grow immediately round the shoot, they can be ploughed out; but not in poor ground, where they will be found in all directions and at great distances from the original set. In poor peat soils, they have been found at so far off from the root as 18 inches. The amount of produce will, of course, vary with soil, treatment, &c. The artichoke will, without doubt or question, do better on poor soils—both aluminous and siliceous, not worn-out peat—than any root or tuber we cultivate; and, on many strong intractable soils it will (as I endeavoured to point out in January) be of very peculiar advantage, from its affording, as it does, in addition to a fair produce, the means of burning a really most considerable weight of soil. It will leave, in fact, from 50 to 60 loads of ashes. But, at the same time, like all tuberous roots, it *glories* in a rich soil, and will give a direct and certain return for manure; being, like all its class, a gross feeder, and finding no soils or manure within the reach of farmers too rich or good for it. Experimentalists, therefore, should give it a chance on a small scale, on good land heavily manured, and not try it on poor land only.

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* I question whether any advantage would be gained by having the sets heavier, notwithstanding it would be so with the potato. But I may easily be in error.

† Here, again, I only speak from my own observation, which I do not think sufficient to establish this remark as an ascertained fact, though I feel called on to mention what I think I have observed.

As regards its use, though I tried my experiments to test its feeding powers on only one class of animals, yet horses, cows, sheep and pigs all relish it, and for any and all of these, as well as for poultry, it will be found a good, clean, sound root, infinitely superior as "feed" to the swede and mangold, or, indeed, to anything but the potato, and must prove, in an infinite variety of ways, more valuable to the farmer. It is satisfactory to see that it is creating great interest, and is likely to have its advantages speedily and largely tested.

J. H.

CALENDAR OF HORTICULTURE.—MARCH.

In lieu of the usual retrospect, I gratify myself, and I hope amuse the reader to his profit, by quoting the following passage from the "History of Surrey," vol. i., published last year. It is familiarly known that on our north, in the districts immediately to the south of London, market gardens now abound; and therein the skill of the occupiers is displayed to a degree of perfection almost boundless. The author of "The Worthies," Fuller, thus wrote about the period of the Restoration of Charles II.:—"Gardening was first brought to England for profit about seventy years ago; before which, we fetched most of our cherries from Flanders, apples from France, and had hardly a mess of rath-ripe peas but from Holland, which were dainties for ladies—they came so far and cost so dear. Since gardening hath crept out of Holland to Sandwich, Kent, and thence into this county, where, though they have given six pounds an acre and upward, they have made their rent, lived comfortably, and set many people on work. O, the incredible profit by digging of ground! For though it be confessed that the plough beats the spade out of distance for speed, (almost as much as the press beats the pen), yet what the spade wants in the quantity of ground it manureth, it recompenseth with the plenty of food it yieldeth; that which is *set* multiplying a hundred-fold more than that which was *sown*. 'Tis incredible how many poor people in London live thereon, so that in some seasons the gardens feed more people than the field" (vol. ii. p. 353, edit. 1811). The evidence concerning the ability of the market gardeners around London is conclusive: their example ought to be followed, so far as may be possible, by every one, who attempts to cultivate land upon economical principles, and with a view to profit.

VEGETABLE DEPARTMENT.

First week. Sow *cabbage-seed* of any approved sorts, in rows apart, each carefully marked. The "*Enfield Market*" is a variety of superior excellence: the Yorks, Penton, Vanack, and Sugarloaf are also valuable. Transplant from the seed-beds of autumn another supply of strong plants for summer succession. Be it remembered that the ground for *all* the cabbage tribe, when transplanted, must be well and deeply enriched; and also that during the growth of the plants, guano-water (1 oz. to a gallon of soft water) is a powerful assistant. Sow more seed for succession; also for savoys, kale of sorts, and Brussels' sprouts; and, over a gentle bed of leaves, a few pans of Cape brocoli, and several kinds of lettuce and celery seed. A one-light box will be a useful adjunct. Transplant *cauliflowers; i. e.*, the supernumeraries under hand-glasses should now, or in any favourable weather of the month, be removed to any rich and warm spot of ground, to stand a yard asunder. Cover with glasses during the night, and at all times till the plants removed have fixed their roots to the soil; give air then, in fine mild weather, to all freely, by raising the glasses on the south side. Stir the ground between growing crops of *peas, beans, winter spinach,* &c. Sow round-leaved spinach occasionally, if required; but the former sort, if kept clean and prudently picked, ought to yield in sufficient abundance till midsummer. Sow peas of one kind or other repeatedly, as former sowings appear above ground. We believe that the *real* *blue Prussian, blue imperial, scimitars, Knight's green dwarf,* and *tall marrow* can never be surpassed, however magnificent may be the titles of some fashionable new varieties. Sow beans also, but prefer the *Windsors;* early horn *carrots,* twice; the lighter sandy loam is the fitting soil: hollow and solid-crowned *parsnips* in stronger loam; and small purple *beet root. Onions* for large bulbs, choosing as most suitable the ground that bore the strongest crop of celery: add a liberal dressing of decayed manure, tread or beat the soil firmly, draw drills nearly an inch deep and nine apart. The best sorts are the *Reading* or *Spanish, globe,* and the *large Tripoli.* Cover the drills with fine rich earth, and pat it down level. The *silver-skin picklers* are sown thickly on poor ground. Prick out *celery plants* of the former sowing into a frame, a few inches apart, and keep them close till well rooted, and then expose them to the air to harden them gradually. *Potatoes:*—The *ash-leaved* and *early Shaws* can be sown twice, *i. e.,* in the first and third week, provided the weather and ground be dry at the time. *Artichokes* can be planted at the end, if the suckers be well rooted; rich, deep soil, like that for celery, should be selected: the plants a yard apart in the rows. *Asparagus:*—Seed may be sown; the plants so raised to remain permanently for cutting; and new beds can be made by planting the strongest one-year-old plants. The end of this month or the first week of April is, according to the weather, a suitable period; but in any case, great depth of soil, a free working loamy turf, four feet deep, and highly tilled and enriched, must form the staple for a plant which ought to remain productive fifteen to twenty years. Here again we are called upon to repeat that manure cannot escape from a sound earth; it may be, and is exhausted by vegetable aliment, but cannot be washed away by rain. Plant in double rows on a four feet wide bed, leaving one foot on the outside of each rank. Give a watering with soft pond water, wherein common salt is dissolved, to the amount of about 180 grains in each imperial pint; that being the proportion in which it is found in sea-water. Avoid dry salt, as before said, after growth begins to be apparent.

FRUIT DEPARTMENT.

The mildness of the weather throughout the winter must, to some extent, have produced its effect; yet not generally, I believe, so much so as might have been expected. *Apricot* blossoms were fully visible, but not expanded, in the third week of February; yet some protection in the form of a moveable screen may be required. Canvas rolling screens, to be let sloping down from the wall-coping to the ground, a foot or more in advance there from its base, should not only be used during cold nights, but for two or three hours of each hot, sunny day. Retardation is of as much, or more consequence than night protection. Hoar-frost should be warded off; and by a converse rule, shade from the direct beams, especially if the air be frosty, should be provided. If glazed sashes be adopted, the glass ought to be roughed, so as to soften and diffuse the solar light. Glass screens protect from rain, cold, and frosty rime; but at the same time they decrease solar heat by refraction, as any one may discover by two thermometers, one suspended outside the screen in the open air, the other within it, both equally opposed to a full south sun; the former, in many instances, showing eight to ten degrees or more of higher temperature than the latter.

Pruning:—*Peach* and *nectarine* trees must soon be finished, after which the sulphuret wash may be carefully applied. The bloom, after a winter so mild, must be very forward by the end of the first week. *Apricots* require protection above any other fruit trees. The *fig* only must not be touched till the weather permit the removal of covering: occasionally an old branch is cut out, but the younger remain at their full length. *Filbert* bushes are pruned so soon as the male catkins begin to shed their pollen (farina). It has been sagaciously observed that "the shaking of the branches will greatly assist the fertilization of the female blossoms, *i. e.,* the crimson styles." As to the best, or Maidstone order of pruning, it perhaps consists of spurring the young laterals as we spur currant bushes, in keeping the centres open and cutting back the leading shoots to a few eyes, the upper one retained always being an outer one. *Strawberries* in rows and beds are now regulated. Cut or pull away the brown old leaves. If the plant stand wide apart, remove some of the old earth with a close-tined fork, and replace with mixed maiden loam and rotten manure, two parts of the former with one of the latter. The rooted, strong runner-plants of last year are now removed to their bearing beds or rows, previously prepared by trenching and manuring deeply at bottom.

FORCING DEPARTMENT.

As the sun's power increases, greater care will be required in modifying artificial heat by night and the admission of air by day. A clear sun in March, acting through glass, frequently raises the thermometer many degrees higher than that in the hottest weather of July and August. It was the custom to disroot *pine-apples* in the March pottings: there is little sense or philosophy in the practice. Pot the young succession plants in turfy loam and a small proportion of rotten dung; plunge in a gentle heat of 80 to 85 degrees; keep close and shade for a time, and maintain an equable, moist, growing heat through the seasons. *Vineries*:—The earliest fruit will have been thinned. Keep the heat steady, about 65 degrees by night, 90 degrees or more (sun) by day, warding off the scalding, direct rays. Avoid the vaporous steam-bath of the old practice, if flavour be any object of interest: continue to stop back to a leaf the growing fruit laterals. These hints will bear practically upon the treatment of all the houses. The borders outside should yet be kept covered to retain the acquired heat equable as possible. The *West's St. Peter's* is a tender skinned, delicious fruit, and ought to be late. Remove the sashes, therefore, and shade the trees from sun till April be closed; then begin to excite the trees very gradually, so that the fruit do not become ripe for six months.

Other departments must stand over.

RETROSPECT.

Two mornings (16th and 17th) of really keen frost, *i. e.* 27 degrees and 25 degrees, have given the amount of our February winter. The mild weather returned with despatch before noon of the latter day, when nearly 50 degrees of Fahrenheit were observed. Before this frost the buds of almost all the earlier roses had pushed an inch in length: chrysanthemums had grown some inches, and the leaves of the laburnum began to expand: crocuses in all warm aspects were in rich flower, and evergreens even had begun to grow. As every white frost has preceded a southerly wind, we may now be assured that the mild character of this winter will be maintained, though cold and drying winds may soon be expected.

Potatoes remain so fine and mealy that the public may consider the late malady as a thing that has passed. If interested parties cease to give utterance to false reports there will remain little cause for disquieting anticipation.

Croydon, Feb. 19th. JOHN TOWERS.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEATH.
Day.	8 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8-9a.m	2 p.m.	10p.m.	
	in. cts.	in. cts									
Jan. 21	29.46	29.50	44	49	40	S. West	lively	fine	sun	cloudy	rain
22	29.83	30.16	35	49	38	S. West	lively	fine	sun	fine	dry
23	30.30	30.30	32	47	35	S. West	gentle	fine	sun	fine	dry
24	30.24	30.18	30	34	33	S. Easterly	calm	fine	fog	fine	dry
25	30.00	29.94	30½	41	38	S. by E., by W.	gentle	fine	sun	cloudy	dry
26	29.86	29.67	35	38	36	S. East	forcibl.	cloudy	cloudy	cloudy	rain
27	29.80	29.94	35	47	39	S. West	gentle	fine	sun	fine	dry
28						Westerly					rain
29	29.80	29.72	39	49	45	S. by West	gentle	fine	cloudy	cloudy	rain
30	29.50	29.30	37	47	40	S. West	strong	cloudy	fine	cloudy	rain
31	29.23	29.20	34	46	40	W. by South	lively	cloudy	fine	fine	rain
Feb. 1	29.40	29.48	34	42	36	N. East	gentle	cloudy	fine	cloudy	dry
2	29.48	29.57	35	39½	33	North, var.	gentle	cloudy	cloudy	fine	rain
3	29.57	29.50	30½	42	42	S. West	gentle	fine	cloudy	cloudy	rain
4	29.77	29.96	32	39	33½	N., S. by W.	gentle	fine	sun	fine	dry
5	29.82	29.52	33	48	48	S. West	brisk	cloudy	cloudy	cloudy	rain
6	29.80	30.13	36	44	35	Westerly	lively	fine	sun	fine	dry
7	30.16	29.99	33½	48	48	S. West	brisk	cloudy	cloudy	cloudy	rain
8	29.86	30.14	45	48	40½	N. Westerly	lively	fine	cloudy	fine	dry
9	30.33	30.40	32	42	39	North	gentle	fine	cloudy	cloudy	dry
10	30.40	30.38	38	42	34	N. West	gentle	cloudy	cloudy	fine	dry
11	30.30	30.26	31	47	37	S. W., var.	gentle	cloudy	sun	fine	dry
12	30.16	30.08	33	45	42	West	gentle	fine	sun	cloudy	dry
13	29.99	30.08	40	46	39	Westerly, S. E.	gentle	cloudy	cloudy	fine	rain
14	30.17	30.25	35	46	41	Westerly	gentle	fog	cloudy	fine	dry
15	30.24	30.25	31	49	35	Wstrly., S. by E.	gentle	fine	sun	fine	dry
16	30.24	30.20	27	40	30	S. East	gentle	fine	sun	fine	dry
17	30.27	30.08	25	41	39	S. S. W.	gentle	fine	sun	cloudy	dry
18	30.04	39.00	39	55	49	S. West	lively	cloudy	sun	cloudy	dry
19	30.00	29.90	48	49	48	S. Westerly	brisk	cloudy	cloudy	cloudy	dry

ESTIMATED AVERAGES OF FEBRUARY.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.82	29.170	53	21	38

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
44.8	34.81	39.8

WEATHER AND PHENOMENA.

Jan. 21—Evening showery; 22, 23—Fine, cool, sunny; 24—Heavy fog after noon; 25—Changeable, chilly; 26—Small rain in evening; 27—Very fine; 28, 29—Changeable, rain; 30—Wind rose, after a fine forenoon; 31—A hint of snow or sleet.

LUNATION.—Last quarter, 24th day, 8h. 17 min. morning.

February 1—Pretty fine; 2—Changeable; 3—Rime, evening rainy; 4—Gentle frost, changeable; 5—Very damp, drizzly; 6—Fine lovely day, calm evening; 7—Much small rain; 8—Fine day; 9—Early rime; 10—Overcast, but fine; 11—Glow in the west at sunset; 12—Early rime, fine day; 13—Much rain early, fine, hazy evening; 14—Dense fog, forming clouds; 15, 16, 17—Keen, three splendid days; 18—Sudden change in night, very warm day; 19—A few drops of rain only, brisk wind and driving clouds. Solar spots have been occasionally seen.

LUNATIONS.—New moon, 1st day, 6h. 2m. morning. First quarter, 9th day, 8 h. 56 m. morning. Full moon, 16th day, 3h. 28m., morn.

REMARKS REFERRING TO AGRICULTURE.—There has been a fair average of fine and rainy weather. A peculiarly mild temperature, and the almost total absence of ground frost, have tended to excite vegetation; yet we cannot complain of over-luxuriance. The wheat is well; winter tares and turnips capital; and meadow grass verdant beyond its wont. Live stock is, we believe, in excellent condition, and no complaints reach us. Potatoes have falsified all lugubrious anticipations, and remain sound and abundant.

Croydon. J. TOWERS.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR FEBRUARY.

The extreme mildness of the weather abroad, and the comparatively low value of most articles in the near continental ports, having been productive of unusually large shipments of both grain and flour—especially the latter—to the United Kingdom, the corn trade in the whole of our districts has ruled excessively heavy since the beginning of the month, and prices almost generally have tended downwards. The late division in the House of Commons, and the resignation of Ministers, are regarded as favourable to the cause of native industry; and it is pretty generally imagined that a fixed duty—say of 5s. per quarter, with a corresponding rate on spring corn and flour—will be submitted to Legislative wisdom. Be that as it may, it is very doubtful to our minds whether a stop will be put to the extensive exports of foreign produce for our markets, and which threaten to render bankrupt the whole of the agricultural body. Our reason for this opinion may be briefly summed up. All who are enabled, from their position, to form anything like an accurate judgment, state that the stocks of grain at this time on hand in France are unusually large; and, further, that those of foreign wheat in the Southern Departments are heavy—certainly far beyond the wants of the consumers. In Paris, the highest price of the best wheat is only 35s. 8d. per quarter, of flour 29s. 1d. per 280lbs., and of bread 4¾d. per 4lbs. loaf. These quotations are fully *forty per cent lower* than in London; and hence it is fair to assume, that so long as the metropolis offers a premium for imports, so long shall we have an influx of produce from abroad. Another strong and, we may add, convincing argument in favour of this supposition is the all-important fact that ours is a ready-money mart for such produce. Doubtless we shall speedily have to report the re-opening of the navigation up the Baltic, as well as in the United States. This will bring us increased supplies of food, and tend to depress prices to some extent. We hear of statements submitted by various parties to the effect that low prices are sure to check importations; but past experience shows that the doctrine of specific prices with open ports is a complete fallacy. For instance, of what value was the late Sir Robert Peel's *average* of 56s. per qr., when we have now inferior qualities of wheat selling at only 23s., and an average price considerably under 40s. per qr.?

Since we last wrote the weather has proved extremely mild here, and, to an extent, vegetative. The few frosts experienced about the middle of the month had the effect of checking the progress of the growing wheats, as well as of improving the condition of the corn in the stack and in the barns. Nevertheless, the value of both old and new wheat, from causes already assigned, has given way from 1s. to 2s. per quarter. Millers, generally, in the present uncertain state of affairs as respects future value, have acted with extreme caution, and we may safely conclude that the quantities of wheat now held by them are unusually small. For the time of year, the influx of foreign barley, oats, beans, and peas, has been good; yet a full average amount of business has been transacted in those articles, at but little alteration in their quotations.

Very favourable accounts have continued to arrive from our flock districts in reference to the early lambing season. The fall is represented as good and healthy, with comparatively few losses. That we have an abundance of stock in the country is evident; not only from the appearance of the grazing districts, but the large numbers of both beasts and sheep which are weekly exhibited in the various markets. The abundance of food, and its extremely low value, have materially assisted most of our graziers, amongst whom oil-cake is rapidly falling into disuse. The heavy imports of stock from abroad have had a depressing effect upon the cattle trade; yet sheep, as is almost invariably the case at this particular period, have sold on rather higher terms.

The steadily increasing demand from the manufacturing districts, and the favourable result of the public sales in London, added to the scarcity of colonial qualities, have produced a firm market for British wools, and really fine qualities have produced rather more money. For the continental markets large parcels have been disposed of; and it is satisfactory to find that the best home-fleeces are being rapidly worked up with fine Australian. The stocks of the latter at this time in London unsold are very little over 1,000 bales. Buyers are, therefore, looking forward to the arrival of the new clip from our colonies.

That the produce of last year's potato crop was exceedingly large, is evident from the present state of our markets for that esculent. The imports from the continent in the course of the month have been under 1,000 tons; nevertheless, prices have fallen, under the pressure of large supplies, fully 10s. per ton. The quantities still on hand are represented as very extensive, and of excellent quality; and we may state that fewer diseased potatoes have made their appearance during the last four months than was ever before recollected. Planting has been carried out extensively, under very favourable auspices.

Large arrivals of foreign grain having been reported in Ireland and Scotland, the corn trade there ruled excessively heavy, and prices have again ruled in favour of buyers. The granaried stocks are much larger than usual.

The general produce markets in London have been devoid of animation. Both hay and straw have sold heavily, at very low prices; viz., meadow hay, £2 8s. to £3 17s. 6d.; clover do., £3 to £4; and straw, £1 1s. to £1 9s. per load.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Full average time-of-year supplies of each kind of fat stock have been on sale in the leading cattle markets in most excellent condition; indeed, the general quality of both beasts and sheep has seldom been equalled. From Scotland, and various parts of England, immense quantities of slaughtered meat have been received up to Newgate and Leadenhall, and which, of course, have materially tended to depress the trade in Smithfield. Sheep, however, have sold tolerably well; but the value of beasts, calves, and pigs has tended downwards. The quotations of raw hides have been well supported, but rough fat, notwithstanding the comparative firmness in the demand for tallow, has met a dull market, owing to the large supplies brought forward. Butchers generally state that the stock continues to "die" extremely well; and it is evident that their profits are now larger than for many years past. The consumers are paying nearly as much for their meat as they were prior to the passing of the new tariff; and yet stock has given way in value fully 20 per cent.!

From abroad, as will be seen by the following statements, the imports of beasts, sheep, and calves have materially increased, notwithstanding the low value of each breed in this country. The London market is, however, the chief market for consignments, even though the rates of freight to Hull, &c., continue lower from the continent than to the metropolis. The numbers of stock at this time on hand in Holland, &c., are unusually large; hence, we may fairly look forward to very extensive importations from that quarter during the whole of the present year. Of late, a marked improvement has been observed in the condition of the sheep received from most of the Dutch ports, from whence, also, we have received some excellent beasts as well as calves. The extremely low value of cake on the continent has given the foreign breeders a material advantage over our own, although it cannot be denied that the use of that article in this country is rapidly falling off, and we may further remark that the English beasts shown in Smithfield since we last wrote have exhibited more decided marks of age than for many years past. This observation applies more particularly to the stock received from Norfolk. Many years since, it was customary for us to derive from that county Scots and home-breds weighing only from 80 to 90, and at the outside 100 stones. Now, however, we have Herefords, Devons, short-horns, &c., with a fair sprinkling of Scots, and scarcely any home-breds, in weight from 110 to 130 and 140 stones. This increase in the supply of meat, added to railway communication, has tended materially to increase the supply of food, and, as a consequence, to keep prices in check.

The total supplies brought forward have been as under:—

	Head.
Beasts	17,393
Cows	324
Sheep	91,568
Calves	1,381
Pigs	2,340

COMPARISON OF SUPPLIES.

	Feb. 1847.	Feb. 1848.	Feb. 1849.	Feb. 1850.
Beasts	15,101	15,404	17,139	16,727
Cows	601	570	617	445
Sheep	84,830	75,160	81,050	80,160
Calves	844	859	1,240	998
Pigs	2,285	1,935	1,247	1,819

The bullock droves have been thus derived:—

	Head.
Norfolk, Suffolk, &c.	7,500
Northern districts	2,600
Other parts of England	1,600
Scotland	1,590

Prices have ranged as follows:—

Per 8 lbs. to sink the offals.

	s. d. s. d.
Beef from	2 4 to 3 8
Mutton	3 4 to 4 6
Veal	3 0 to 4 0
Pork	2 10 to 4 0

COMPARATIVE PRICES.

(Per 8lbs., to sink the offal.)

	Feb., 1847.	Feb., 1848.	Feb., 1849.	Feb., 1850.
	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.
Beef, from	2 10 to 4 4	3 2 to 4 8	2 8 to 3 8	2 8 to 3 8
Mutton	3 6 to 5 0	3 6 to 5 6	3 0 to 4 6	3 0 to 4 6
Veal	4 2 to 5 4	4 2 to 5 4	3 8 to 5 8	3 0 to 3 10
Pork	3 6 to 5 0	3 10 to 5 2	3 4 to 4 6	3 2 to 4 0

From abroad, the annexed supplies came to hand:—

	Head.
Beasts	2,110
Sheep	8,291
Calves	1,330
Pigs	97
Total	11,828
Corresponding month in 1850	3,880
Same month in 1849	5,642
Ditto ditto 1848	3,546
Ditto ditto 1847	3,946

At the outports, the arrivals have been confined to about 1,200 head, chiefly sheep and calves, from Holland.

Shearing having been generally commenced in our forward flock-districts, sheep have come forward somewhat freely out of the wool.

Newgate and Leadenhall markets have been heavily supplied with Scotch and country-killed meat; the total arrivals in the course of the month having been little short of 40,000 carcasses. As might be anticipated, the general demand has ruled heavy, and previous rates have been with difficulty supported. The highest price of beef has been 3s. 4d.; mutton, 4s.; veal, 4s.; and pork, 4s. per 8lbs., by the carcase.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BATH FAIR was abundantly supplied with beef and mutton, in good order, for which the demand was brisk, and much business was done. Fat beef fetched from 8s. to 9s. per score; and mutton varied from 6d. to 6½d. per lb. Grazing stock was in moderate supply, but the sales effected were at low prices.

CASTLE DOUGLAS FAIR.—The show of horses was neither numerous nor of first-rate quality, and prices rather upon the wane than otherwise; so that, upon the whole, it may be said to have been a very slack market.

DEVIZES FAIR.—There was a larger supply than usual of oxen, for which the demand was slow, and prices lower than last year. Fat beef was in fair supply, the trade very dull, and prices from 7s. 6d. to 8s. 6d. a score. Good grazers sold readily and pretty well, being all early cleared off; but inferior ones were not much in demand, and were lower.

DORCHESTER FAIR was very well attended. There was a large supply of cattle, but a considerable number of them being of an inferior description, they sold dull. Good milch cows and calves sold readily at from £10 to £15; barreners, £5 to £10; steers, £9 to £11 each. Fat beasts were rather plentiful, but they did not meet a very brisk sale. There were but few fat sheep penned, and for which 6d. to 6½d. per lb, was demanded. There was a large show of horses; but most of them being animals of an inferior quality, not many of them changed hands; but good cart horses sold readily.

DUMFRIES FAIR.—A fair amount of business was done. There was fully an average number of horses exhibited, viz., between three hundred and four hundred, and a great proportion of them were of first-rate quality. There were a number of dealers from a distance present, besides our own local dealers. Sales were far from being brisk; but draught horses of good quality brought much about the same as obtained at our Roodmas fair, viz, from £40 to £45 for best quality, and a few very superior animals brought nearly £50; second kind, £30 to £40; and for a third class, £20 to £30. Inferior animals, at all prices. The number of roadsters and ponies was limited, for which there was not a great demand. Yesterday, sales were very slow, and the rates of the previous day were not sustained. The numbers exhibited amounted to fully 500.

EGREMONT FAIR.—The morning was very unfavourable; but, notwithstanding, a fair average quantity of good stock was exhibited, and buyers and sellers were numerous. The demand was tolerably brisk, and a large number of beasts changed hands. Horses also sold readily, at good prices.

EXETER FAIR.—On Wednesday large numbers of store bullocks were driven in, and we are glad to find that most of the stock met with a tolerably ready sale at remunerative prices. The supply of fat beef was not large, and must be quoted at 7s. 6d. to 8s. per score. Working oxen sold freely at £12 to £18 each; steers, £7 to £10 do. Cows and calves were in demand, and sold from £7 up to £15, according to quality. Barreners were also plentiful; those in poor condition made about 4s. 6d. per score; middling quality, 5s.; good fresh do., 5s. 6d., and very fresh meaty bullocks, 6s. per score.

GATEHOUSE FAIR.—The numbers of horses exhibited were extremely limited, and sales were far from brisk. Good animals brought fair prices; but for inferior animals there was little or no demand.

GLOUCESTER MONTHLY MARKET. — On Monday last there was a large supply of beasts, but of an inferior quality. The beef trade ruled dull, at from 4½d. to 5d. per lb. The supply of mutton was short, with a brisk demand at from 5½d. to 6½d. per lb. Pigs, from 7s. to 7s. 6d. per score.

LEOMINSTER FAIR.—The supply of stock was very good, both in quantity and quality; nearly all were sold, the attendance of buyers being numerous. Beef, from 4½d. to 5d. per lb. Mutton, 6d. per lb. Pork, 7s. to 7s. 6d. per score. The business done in horses was trifling.

LOUGHBOROUGH FAIR.—The attendance of both purchasers and stock was very limited, and but little business was done. The horse fair was composed of animals of the most inferior description, very few of which changed hands.

LOUTH FAIR presented only a small show. Beef, 5s. to 5s. 6d. per stone. Mutton, 6d. per lb.

MARKET HARBOROUGH FAIR, (Monday last.)—Business was carried on in a dispired manner, and very little was done.

MONMOUTH FAIR, Feb. 19.—There was but a small supply of stock of any description, and business was very dull. The principal business was in the horse fair, but there did not appear to be any dealers from a distance present.

NEWARK FORTNIGHT FAT-STOCK MARKET.—There was a good show of stock, especially sheep, many of which were of good quality. A ready sale was experienced, and more than an average amount of business was done, at about last week's prices. There were 499 sheep, and 81 beasts penned.

NORTHALLERTON FAIR, Feb. 14. — There was an excellent supply of fat stock of first-rate quality, and a number of buyers. Fat beasts sold at from 4s. 9d. to 5s. 6d. per st., without a clearance. There was also a good show of lean stock, and numerous purchasers, at prices much the same as last October Fair. Of in-calving cows there was only an indifferent show, for which there was a fair demand.

NORTHAMPTON FAIR, Thursday, Feb. 20. — There was but a limited supply of fat sheep, which caused a rather better trade, at prices varying from 3s. 10d. to 4s. per stone of 8lbs. Fat ewes made from about 3s. 4d. to 3s. 6d. per stone, with a flat trade. The supply of store sheep was large for this fair, and a tolerable business was done in them. The supply of fat beasts was also very large, with a dull sale, at prices varying from 2s. 10d. to 3s. per stone of 8lbs. The supply of store beasts was not large, and principally consisted of Herefords; trade flat. There were but few milking cows, &c.

PETERBOROUGH FAT STOCK MARKET, (Wednesday last.)—There was a good supply of Beasts, but the trade very dull, and 5s. 6d. per stone the top price; Sheep 550, with an active demand, and most sorts realizing 5½d. per lb. Pigs, 4s. 3d. to 4s. 6d. per stone. A buyer from Birmingham took off a quantity, or the Pork market would have been very flat. Our Saturday market beginning to fill, in-lambed Ewes from 34s. to 38s. each; Lamb Hogs and Shearlings sought for eagerly, the former from 24s. upwards. Cow stock ordinary, and dull of sale.

WIGTON HORSE FAIR, Feb. 20.—There has been a pretty fair attendance of horses, particularly the better class. Intending buyers were also tolerably numerous; but owing to the high prices generally asked, the sales effected were comparatively few.

WINSLOW FAIR.—On Tuesday last the supply of sheep was more limited than usual, neither were they much in demand. The cattle, however, were more abundant, and we were happy to observe went off briskly, at an advance in prices.

WORCESTER FAIR.—The supply of stock, in quality and number, was perhaps superior to any former February fair. Buyers numerous, and nearly all sold. Beef, best, 4½d. to 5d.; inferior, 4d. per lb. Mutton in short supply, but prices good, from 6d. to 6½d., and, in some few instances, small wethers realized 7d. per lb. Pork very little shown: price, 4½d. per lb.; bacons, 7s. per score. In horses very little done.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF FEBRUARY.

The distress under which the agricultural interest has been labouring in the British islands since the first introduction of free-trade in corn having increased from year to year until it reached a point when its existence could no longer be denied, her Majesty's ministers were compelled to allude to the subject in the speech from the throne, delivered by the Queen on the opening of parliament. They contented themselves, however, by merely deploring the fact, and expressing a hope that the evil would cure itself. As to proposing any remedies, such a proceeding does not appear to have been even contemplated. Mr. Disraeli, therefore, gave notice of his intention to bring forward a motion on the following Tuesday (11th of February), to the effect that the distress which was justly lamented in her Majesty's speech rendered it the duty of her Majesty's ministers to introduce, without delay, such measures as were calculated most effectually to relieve the same. The debate which this led to occupied the house till the 13th, when the division took place, the votes for the motion being .. 267
Against it 281

Majority for ministers, only 14

The result was justly regarded as a virtual defeat of the government, and, though matters went on for another week, Lord J. Russell felt himself called upon to tender his resignation on the 21st instant.

What this may lead to it is, at present, impossible to foresee; meanwhile, we urge farmers in all parts of the kingdom to be prepared, in case of a general election, to return such members as will advocate their interest.

Circumstances seem about to take a turn, and, if they fail to use their best endeavours to profit by the present ministerial difficulty, the opportunity may be lost.

At the time we write, nothing definite has yet been arranged. On Monday (24th February) Lord J. Russell adjourned the house until the following Friday, for the purpose of endeavouring, in the interval, to reconstruct the cabinet, but whether he will succeed appears very doubtful.

So much for politics. We shall now proceed with that part of our subject which usually forms the staple of our remarks—the grain trade and its prospects. It must, of course, be at once perceived that the future range of prices will be greatly influenced by what may yet be done in the House of Commons; and, as it is still doubtful which party will obtain power, it would be vain to offer any decided opinion with regard to legislative measures. We shall, therefore, confine our observations to such matters as are not likely to be influenced by the future operations of government, commencing with the weather. The winter of 1850 and 1851 has certainly been of an unusual character. In this country, the frost has at no time been sufficiently severe to interrupt the course of the inland navigation; and even on the continent of Europe the season has been much milder than in ordinary years. The young wheat plant has, however, received occasional checks, and, though its appearance is strong and healthy, it exhibits no symptoms of premature luxuriance; indeed, on this head the accounts are almost universally favourable, not only from our own farmers, but likewise from most of the large corn-growing countries abroad. There are, consequently, no grounds to apprehend that the absence of severe cold has proved injurious to the autumn-sown crops. The month of February has, on the whole, been auspicious. We have had occasional night frosts, and a few dull foggy days; but the mean temperature has been high, and the total quantity of rain which has fallen has not been excessive. The land has, therefore, got rid of some of the superfluous moisture; and, within the last week or two, our farmers have been engaged in the fields, preparing the soil for the reception of the spring crops. They have, nevertheless, brought fair supplies of corn forward, and at most of the markets in the agricultural districts the quantity of grain offered has exceeded what has been required for immediate consumption, the consequence of which has been that prices have continued to tend downward, even in those parts of the kingdom where the arrivals from abroad have not come into direct competition with the home supplies. That the depression has, however, been principally caused by the extent of the foreign importations does not admit of doubt; and we regard it as certain that, so long as our ports are allowed to remain open to receive the surplus growth of the entire world, the value of agricultural produce will inevitably rule low in these islands. All the sophistries of the free-trader cannot convince us that our farmers can obtain a remunerative return for their capital and industry with the price of wheat below 40s. per qr., and those of other grain in proportion; and that foreigners will inundate our markets with supplies whilst present or even lower prices can be reckoned upon, we feel perfectly convinced.

During the month ending 5th of Feb. last, the quantities of foreign grain, pulse, and flour, entered for home consumption in the United Kingdom, compared with those in the corresponding month in 1850, were—

	Month ending Feb 5, 1851.	Month ending Feb. 5, 1850.	Increase.	Decrease.
Wheat	328,482 qrs.	141,761 qrs	186,721 qrs.	—
Barley ..	70,742	39,984	30,758	—
Oats......	41,917	25,917	16,000	—
Maize....	56,007	52,824	3,183	—
Peas	8,956	6,748	2,208	—
Beans.. .	20,123	32,776	—	12,653 qrs.
Flour	411,979 cwts.	258,251 cwts.	153,728 cwts.	—

These figures are conclusive, and we have no doubt that the impetus which has been given to agriculture abroad by the repeal of our corn laws, will have the effect of causing a gradual and continued increase of shipments from the principal foreign corn-growing countries, so as to render the position of our farmers worse and worse, unless something be done to put them on a fair footing to meet the competition. In reviewing the course of the trade during the month, we shall confine our remark to what has taken place at Mark Lane, the alterations which have occurred in prices in the metropolis having been pretty closely followed at the leading provincial markets.

The arrivals of wheat coastwise into the port of London have been small throughout the month, the receipts having scarcely averaged 2,800 qrs. per week. Nearly the whole of the English wheat brought forward has come to hand in soft, rough condition—a circumstance which has greatly interfered with the sale, and to which the extreme caution displayed by the millers in making purchases may be partly attributed. Making due allowance for the falling off in quality, scarcely any change can be said to have taken place in prices since we last addressed our readers, for lower terms have only been accepted in cases where the intrinsic value of the article had been lessened by the want of condition. The best dry qualities of Essex and Kent wheat have been placed at rates precisely the same as those current when we last addressed our readers, the comparative scarcity of fine fresh-thrashed samples having caused the better sorts to be in fair request. The general runs of English wheat have, on the other hand, been very unsaleable, and it has frequently occurred that the supply of Monday (consisting, perhaps, of a few hundred quarters) has not been disposed of until quite the close of the week; we have, consequently, with very small receipts, had a constant pressure on the market. The common runs of Essex, and Kent red wheat, are not worth more than 36s. to 38s. per qr. at present, whilst really fine dry parcels would bring 40s., and superior whites 45s. to 46s. per qr. The position of the averages will prove how small a proportion of last year's wheat crop was really good; the last weekly return for the United Kingdom being 37s. 2d. per qr.

The arrivals of foreign wheat, though not particularly large, have been good for the time of the year — upwards of 35,000 quarters having come forward. Independently of this supply, we have had an abundant display of samples from granary, and holders have certainly manifested more anxiety to realize than they showed last month. The country inquiry has not at any period been active, the provincial millers having been enabled to obtain what they have required in their own vicinity; those in the north from Liverpool, Wakefield, and Hull; and the southern and western millers have visited Bristol, Birmingham, and Gloucester: at all of which places they have been enabled to buy on as favourable terms as at Mark Lane. The arrivals from abroad have meanwhile been more than sufficient to provide for the local demand, and stocks in warehouse have increased rather than diminished since our last. The tendency of prices has, under these circumstances, been downwards, and quotations are scarcely so high as they were at the close of January. A few days ago a parcel of good Rostock wheat of last year's growth, weighing 60 to 60½ lbs., was sold at 38s.; whilst a lot of superior high mixed Danzig was parted with at 45s. per qr., terms which would certainly not have been accepted when we last addressed our readers. The fact is, that holders are beginning to despair of seeing any improvement, and as the offers from the Baltic are increasing, it is deemed prudent to realize when practicable. The arrivals of Polish Odessa wheat off the coast have not been nearly so large as in January; still sufficient has come forward to prevent any rally, and the article has of late been freely offered at 33s. to 34s. per qr., cost, freight, and insurance, without exciting much attention. A large number of vessels are known to be still on passage from the Black Sea and Mediterranean, laden with wheat, and unless the demand for floating cargoes improve, any increase of arrivals on the coast would probably cause a further fall in prices.

The top quotation of town-manufactured flour has remained stationary throughout the month. This can scarcely, however, be regared as a criterion of the rates at which business has been done, as by far the greater portion of the sales has consisted of household flour, which has been offered relatively lower. Norfolk and other country household has lately been selling at 27s. to 28s. per sack from on board ship in the river, and other sorts at corresponding terms. The arrivals of flour from abroad have been on a liberal scale, and the constant pressure of foreign on the market has been severely felt by our millers. Very good qualities of French have been selling at 29s. to 30s. per sack, and the inferior descriptions relatively cheaper. The supplies from America having been comparatively small at this port, importers of the latter have declined to submit to any reduction of consequence, and fair brands of Western Canal have been held at 21s. to 22s. per barrel.

In the early part of the month we received good supplies of barley of home-growth, and the receipts from abroad were at the same time ample; since then the arrivals coastwise, as well as the foreign supplies, have fallen off; but there has been no scarcity, except of the finest malting qualities. Really choice samples have come forwards so sparingly as to command full prices and a ready sale; but all other descriptions have receded more or less in value. The fall on the common sorts of malting and distilling barley cannot be quoted less that 1s. per qr., and grinding samples were at one period offered fully 2s. per qr. lower; since then, however, a trifling rally has occurred, and good heavy foreign for feeding cannot now be bought below 20s. per qr.

The malt trade has been influenced by the dull tone of the barley market, and the operations have been on a restricted scale; in point of price however, we have no change to report.

Until within the last week or two, we have had plentiful receipts of oats from one quarter or the other. More than the usual proportion has been from Scotland; and there can be no doubt that the last crop yielded well in that part of the kingdom. That the consumption of oats has been a good deal economized, owing to the unusually mild character of the winter, cannot be questioned—green food having been abundant all through the season. About the close of last month, the oat trade was exceedingly depressed; subsequently, the pressure on the market rather increased, and about the middle of the month a further decline of 1s. per qr. took place—good French oats being then offered at 16s. 6d.; other sorts of foreign at proportionate terms, and English, Scotch, and Irish feed at rates varying at from 16s. to 20s. per qr. The inquiry has since slightly improved, and the finer kinds of home-grown corn have, in some cases, realized rather higher terms, but we are unable to notice any rally in the value of the ordinary descriptions.

English beans were much neglected in the early part of the month, and prices had rather a downward tendency. Since then the receipts have fallen off, and a moderate demand having sprung up for the finer sorts for seed, quotations are at present quite as high as they were at the close of January. Egyptian and other kinds of foreign beans have been in retail request for feeding purposes, and have not varied in value.

The inquiry for white boiling peas has not improved—the continuance of mild weather having prevented any increase in the consumption of this article. Good breakers have been offered at 27s. to 28s., and fine at 30s. per qr. Grey and maple peas have come more sparingly to hand than white, and have sold at relatively higher prices.

There has been little or nothing doing in Indian corn on the spot, and the transactions in floating cargoes have been of less importance than last month. Good sound Galatz, to arrive, has not been offered below 30s. to 31s. per qr., cost, freight, and insurance, which prices buyers have been unwilling to pay for cargoes on passage; but those arrived off Falmouth and Queenstown have been placed at the terms named.

Though prices of grain have been better supported on the continent of Europe and in America than might have been expected from the position of affairs in this country, still it is plain that the dull advices from Great Britain have not been altogether without influence.

The letters received from the principal Baltic ports within the last eight or ten days certainly speak with less confidence than before of the probable future, and offers have been received from thence to ship wheat at first open water at terms which a few weeks ago would not have been accepted by sellers.

The downward tendency has been less apparent at Danzig than at the Lower Baltic ports, which we are inclined to attribute to the fact that most of the stock is held at that place by wealthy Polish Jews, who have generally paid high for fine qualities, and are very unwilling to resell at a loss on the original cost. This they will, however, be obliged ultimately to do, unless anything unforeseen should occur to give an impetus to the English demand. The latest quotations from Danzig are out of all proportion to the value of the article here, and the consequence had been that the few orders received had remained unexecuted, and little or no business had been done. For superior samples of high-mixed, old, equal to 43s. to 45s., fine high mixed new 40s. to 42s., and the commoner sorts from 34s. up to 38s. per qr., free on board, had been asked. The weather was mild and open, and no impediment existed to shipments being made.

From Konigsberg we learn that the state of the roads had prevented supplies coming forward freely, and that holders of granaried samples had demanded former prices for fine qualities; indeed, quotations may be said to be relatively higher at the last than at the first named port, and parties desirous of purchasing would therefore direct their attention to Danzig, the natural result of which had been that scarcely any sales had been made at Konigsberg for shipment in spring.

Good supplies of wheat appear to have been brought forward in the early part of the present month at many of the Lower Baltic ports; and the merchants having been unwilling to enter into speculative investments, the growers had not been able to realize such high prices for their produce as before; and from present appearances we are inclined to think if the British demand does not increase materially, that prices will undergo a further decline on the continent.

Stettin letters state that fair qualities of red Silesian wheat, weighing 61 to 62 lbs. per bushel, had been offered at 34s. per qr. free on board, and other sorts at proportionate rates without leading to sales of importance. Spring corn had, on the other hand, come forward sparingly, and both barley and oats had commanded full terms for local consumption.

At Rostock a moderate amount of business seems to have been done in wheat for spring shipment. For good 62lb. parcels, equal to 34s. 6d., selected 36s., and choice samples 37s. per qr., free on board, had been asked, with a 3s. freight to London.

At Wismar the nominal price for fine wheat was, according to the most recent advices, 35s.; and at Greifswald, Anclam, Stralsund, &c., similar terms were asked.

The cheapest sale we have yet heard of is reported from Lubeck, a parcel of fine Holstein wheat, weighing 62lbs. per bushel, having been sold at 37s. per qr. cost and freight.

At Hamburgh the transactions have throughout the month been on a retail scale, few export orders having, it is stated, been received there, either for wheat or spring corn. Marks wheat of 61½lbs. weight, on the spot, had been offered at 36s. 6d. per qr. free on board, whilst from outports there had been offers at 34s. 6d. to 35s. per qr., without leading to much business.

The advices from Holland are of very little interest, and the value of wheat being nearly as high at Amsterdam and Rotterdam as at Mark Lane, there is no prospect of large consignments from that quarter at present.

In Belgium prices are likewise too nearly on an equality with our own, to admit of business being done with advantage.

From France we shall probably continue to receive supplies of flour and wheat, though the margin for profit is certainly very narrow. The stock of flour at Paris is large; and notwithstanding the enormous shipments which have from time to time been made to this country, the supplies at the principal ports on the coast had, it appears, kept pace with the demand.

From the Mediterranean the reports are not of much interest. At Marseilles, Leghorn, &c., Polish Odessa wheat was relatively dearer than in our markets, still most of the cargoes from the Black Sea, &c., were being directed to British ports.

The latest advices from Alexandria inform us that the best qualities of wheat were obtainable at that port at 15s. 11d. to 16s. 8d., beans 14s. 11d. to 15s. 2d., Indian corn at 14s. 4d. to 14s. 9d., and barley at 9s. 6d. to 10s. per qr. free on board.

The exports from thence had been

	During the year 1850.		During the year 1849.
	Ardebs.		Ardebs.
Wheat	177,649	..	55,481
Beans	32,086	..	42,741
Indian corn	12,128	..	3,525
Barley	23,085	..	14,189

By the steam ship "Canada" we have accounts from the United States of recent dates. Business in breadstuffs seems to have remained dull there, and the value to have undergone little change.

The English advices being considered very discouraging, comparatively few shipments were being made to British ports.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter				
Wheat, Essex and Kent, white, new..	38	to43	fine up to		49
Ditto ditto old ..	41	45	,,		49
Ditto ditto red, new....	36	41	,,		43
Ditto ditto old	39	41	,,		44
Norfolk, Lincoln, & Yorksh., red, n.	33	38	,,		41
Ditto ditto old..	39	41	,,		43
Ditto ditto white, new	39	41	,,		45
Ditto ditto old..	41	43	,,		45
Barley, malting, new..........................				23	25
Chevalier, new				30	31
Distilling, new				22	24
Grinding, old			18	21	22
Malt, Essex, Norfolk, and Suffolk, new	43	45	extra		47
Ditto ditto old	44	47	,,		49
Kingston, Ware, and town made, new	50	53	,,		55
Ditto ditto old	48	54	,,		56
Oats, English feed, new............	15	17	fine		19
Potato, old	17	21	extra		22
Scotch feed, new	16	18	fine		19
Ditto, old	18	21	extra		22
Irish feed, white, new	15	17	fine		17
Ditto, old	19	20	extra		21
Ditto, black, new..............	14	16	fine		18
Rye	24	26	old	23	25

	Shillings per Quarter			
Beans, Mazagan	24	25	,, 25	27
Ticks........................	25	26	,, 27	29
Harrow........................	25	27	,, 28	31
Pigeon	27	29	,, 29	32
Peas, white boilers..............	26	28	,, 26	28
Maple	26	28	,, 27	29
Grey	25	27	,, 27	28
Flour, town made, per sack of 280 lbs.	—	—	,, 35	40
Country marks..............	—	—	,, 28	32

FOREIGN GRAIN.

Wheat, Dantzic, mixed..	42	to45	high mixed	46	48	extra	50
Konigsberg	40	44	,,	45	47	,,	48
Rostock, new	43	45	fine old	44	46	,,	48
Pomera., Meckbg., aud Uckermk., red	42	43	extra	44	45		
Silesian .... ,,	40	42	white	42	45		
Danish and Holstein .... ,,	27	40	,,	40	42		
Rhine and Belgium.......... ,,	40	44	old	42	45		
French.................. ,,	38	41	white	40	43		
Odessa, St. Petersburg, and Riga..	33	35	fine	36	38		
Barley, grinding				18	20		
Distilling				22	24		
Malting				24	26		
Oats, Dutch, brew, and Polands				18	20		
Feed				15	17		
Danish and Swedish feed				15	17		
Stralsund				16	19		
Russian				16	18		
French				16	17		
Beans, Friesland and Holstein	23	25	Konigsberg	28	32		
Peas, feeding	24	24	fine boilers	26	28		
Indian Corn, white	30	32	yellow	28	30		
Flour, French, per sack	28	32	fine	32	34		
American, sour per barrel	20	21	sweet	22	23		

IMPERIAL AVERAGES.

For the last Six Weeks.

	Wheat.		Barley.		Oats.		Rye.		Beans		Peas.	
Week Ending:	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Jan. 11, 1851..	38	1	22	9	17	2	22	1	26	9	27	0
Jan. 18, 1851..	38	0	22	8	16	9	24	8	26	7	26	11
Jan. 25, 1851..	38	0	22	7	16	7	23	2	26	4	27	5
Feb. 1, 1851..	37	10	22	9	16	7	22	7	25	11	26	6
Feb. 8, 1851..	38	1	22	10	16	9	23	11	25	10	26	0
Feb. 15, 1851..	37	8	22	11	16	2	23	10	25	5	26	10
Aggregate average of last six weeks	37	11	22	9	16	8	23	4	26	2	26	9
Comparative avge. same time last year	39	8	25	4	15	6	22	6	25	9	27	5
Duties........	1	0	1	0	1	0	1	0	1	0	1	0

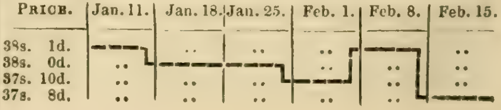
LONDON AVERAGES.

		£	s.	d.			£	s.	d.
Wheat..	1,717 qrs.	2	0	1	Rye....	6 qrs	1	2	6
Barley .	2,558	1	4	1	Beans ..	722	1	5	5
Oats ..	12,373	0	16	6	Peas ..	554	1	9	8

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's *Gazette.*		Av.		Averages from the corresponding *Gazette* in 1850.		Av.	
	Qrs.	s.	d.		Qrs.	s.	d.
Wheat ..	87,051 ..	37	8	Wheat ..	91,307 ..	37	9
Barley ..	81,340 ..	22	11	Barley ..	81,129 ..	23	10
Oats	28,025 ..	16	2	Oats	24,089 ..	15	4
Rye	49 ..	23	10	Rye	55 ..	20	7
Beans	6,941 ..	25	5	Beans	9,790 ..	24	11
Peas	2,194 ..	26	10	Peas	1,983 ..	26	10

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING FEB. 15, 1851.



PRICES OF SEEDS.

LONDON, Monday, Feb. 24.

The uncertainty felt as to what changes may be made in the duties on Seeds interfered with business to-day, and in the absence of operations of moment, quotations of most articles remained nominally unaltered. The season for Clover is now coming on, and a more active inquiry may be expected.

BRITISH SEEDS.

Linseed (per qr.).. sowing 60s. to 65s.; crushing 48s. to 52s.
Linseed Cakes (per 1,000 of 3 lbs. each).. £8 0s. to £8 10s
Cow Grass (nominal) .... £8 to £10
Trefoil (per cwt.) .... 16s. to 20s.
Rapeseed, (per last) new £25 to £27 ...... old £— to £—
Ditto Cake (per ton).................. £4 0s. to £4 10s.
Mustard (per bushel) white 5s. to 7s.; .. brown, 8s. to 10s.
Coriander (per cwt.).......................... 16s. to 24s.
Canary (per qr.).......... new 44s. to 45s, fine 46s. to 47s.
Tares, Winter, per bush., 4s. 0d. to 4s. 6d.; Spring, nominal.
Carraway (per cwt.).......... new, 30s. to 32s.; fine 33s.
Turnip, white (per bush.) —s. to —s.; do. Swedish, —s. to —s.
Cloverseed .... red 48s. to 52s., fine 55s. to 60s.

FOREIGN SEEDS, &c.

Clover, red (duty 5s. per cwt.) per cwt. .... 35s. to 55s.
Ditto, white (duty 5s. per cwt.) per cwt. .... 33s. to 52s.
Linseed (per qr.) .. Baltic 42s. to 45s.; Odessa, 44s. to 48s.
Linseed Cake (per ton)................ £6 0s. to £7 10s.
Rape Cake (per ton) .... £4 0s. to £4 10s.
Hempseed, small, (per qr.) 32s. to 33s., Do. Dutch, 34s. to 36s.
Tares, (per qr.)........ small 22s. to 25s., large 30s. to 36s.
Rye Grass (per qr.) .... —s. to —s.
Coriander (per cwt) .... —s. to —s.

HOP MARKETS.

BOROUGH, Monday, Feb. 24.

A steady demand exists for good samples, at fully the quotations of this day week.

WORCESTER (Saturday last). — Our market remains in much the same state as last reported, full rates being obtained for all good Hops.

POTATO MARKETS.

SOUTHWARK, Waterside, Feb. 24.

Our market continues well supplied from Yorkshire and Scotland. The weather being so mild, this has been the worst week for trade we have had for the season, and it is with difficulty our highest quotations are realized.

The following are the prices :—

York Regents................	70s. to	90s. per ton.
Scotch	60s. to	70s.
Scotch Cups	50s. to	70s.
Cambridge and Lincoln Regents.	60s. to	75s.
French whites................	50s. to	60s.

PRICES OF BUTTER, CHEESE, HAMS, &c.

	s.	s.
Friesland, per cwt.	104 to	106
Kiel	98	100
Dorset	96	108
Carlow	90	94
Waterford........	84	88
Cork	88	90
Limerick	80	86
Sligo	84	90
Fresh Butter, per doz.	12	14
Cheshire Cheese, per cwt., ...	52	70
Chedder do.	56	68

	s.	s.
Double Gloucester, per cwt.	46 to	54
Single do..........	44	52
York Hams	68	78
Westmoreland do. .	68	74
Irish do...........	60	66
American do.	28	36
Wiltshire Bacon, green, ...	48	50
Waterford Bacon ..	48	50
Hamburgh do.	40	42
American	30	36

ENGLISH BUTTER MARKET.

Monday, Feb. 24.

Fine Dorset Butter sells readily at last week's prices, but fresh is easier to purchase this day.

Dorset, fine weekly......... 108s. to 112s. per cwt.
Do. middling .... 96s. to 104s.
Fresh .... 9s. to 13s. per doz. lbs.

BELFAST, (Friday last.)—Butter: Shipping price, 86s. to 90s. per cwt.; firkins and crocks, 9d. to 9½d. per lb. New Bacon 42s. to 44s.; Hams, prime, 60s. to 64s. per cwt.; second quality, 54s. to 56s.; Mess Pork, 60s. to 62s. per brl.; refined American Lard, in bladders, 40s. to 44s.; kegs and firkins, 42s. to 44s.; Irish Lard, in bladders, 44s. to 50s.; kegs or firkins, 44s. to 46s. per cwt.

Feb.	Butter, per cwt.				Bacon, per cwt.				Dried Hams per cwt.				Mess Pork per brl.			
20.	s.	d.	s.	d.	s.	d.	s.	d	s.	d.	s.	d	s.	d	s.	d.
1847	94	0	96	0	56	0	66	0	68	0	76	0	77	6	80	6
1848	88	0	92	0	58	0	62	0	50	0	65	0	70	0	80	0
1849	70	0	86	0	48	0	50	0	68	0	80	0	77	6	80	0
1850	70	0	78	0	38	0	40	0	68	0	80	0	76	0	77	6
1851	86	0	90	0	42	0	44	0	60	0	62	0	60	0	62	0

BREAD.

The prices of wheaten Bread in the metropolis are from 6½d. to 7d.; and household do., 5d. to 6d. per 4lbs. loaf.

HAY MARKETS.

Saturday, Feb. 22.

Smithfield.—A full average supply, and a sluggish demand.

Cumberland.—Supply tolerably good, and trade dull.

Whitechapel.—Trade dull.

At per load of 36 trusses.

	Smithfield.		Cumberland.		Whitechapel.	
Meadow Hay	48s to	77s 6d	47s to	80s	45s to	77s
Clover Hay	60s	80s	60s	80s	60s	82s
Straw	21s	27s	22s	29s	21s	28s

OILS.

Linseed, 33s. 3d. per cwt.; Rapeseed, English, refined, 35s. do. foreign, 36s.; Gallipoli, per tun, 43*l.*; Spanish, 42*l.*; Sperm, 84*l.*; do. bagged, 84*l.*; South Sea, 33*l.*; Seal, pale, 35*l.*; do., coloured, 34*l.*; Cod, 38*l.*; Cocoa Nut, per ton, 38*l.* to 40*l.*; Palm, 29*l.* 6s.

BARK.

Per load of 45 cwt.

English, Tree..................	£13	0	0	to	£15	0	0
Coppice	14	0	0		16	0	0

HIDE AND SKIN MARKETS.

			s.	d.		s.	d.	
Market Hides,	50 to	60lbs.......	0	2	to	0	2¼	per lb.
Do.	60	70lbs.......	0	2¼		0	2½	,,
Do.	70	80lbs.......	0	2½		0	3¾	,
Do.	80	90lbs.......	0	3¼		0	3¾	,,
Do.	90	100lbs.......	0	3½		0	4	,,
Do.	100	110lbs.......	0	4		0	4½	,,
Calf Skins, light		....	1	6		3	6	each.
Do. full		....	6	0		0	0	,,
Horse Hides		....	6	0		0	0	,,
Polled Sheep		....	6	0		7	6	,,
Kents and Half breds		....	4	11		6	0	,,
Downs		....	3	9		4	11	,,
Shearlings		....	0	6		0	0	,,

FLAX.

BELFAST, (Friday last).—The demand has fallen off, and although I continue former quotations, buyers have the advantage this week. Fine, 75s. to 80s; good, 68s. to 72s.; good middling, 55s. to 66s.; middling, 48s. to 54s.; coarse, 40s. to 45s. per cwt.

TIMBER.

	£	s.	d.		£	s.	d.
Baltic Timber, per load of 50 cubic feet..	3	0	0	to	3	15	0
Yw. Deals, per standard hundred ..	10	10	0	..	15	10	0
Deck Deals, per 40 feet 3 in.	0	15	0	..	1	0	0
Pipe Staves, per mille	110	0	0	..	140	0	0
Lathwood, per fm. of 6 feet........	8	10	0	..	10	0	0
Petersburgh, Riga, and Archangel .... Yw. Deals, per stand. hundred ..	12	0	0	..	15	0	0
White............................	9	0	0	..	10	0	0
Yw. Battens........................	12	0	0	..	14	0	0
Riga Logs, for 18 feet cube	2	10	0	..	3	10	0
Stettin Staves, per mille of pipe..........	100	0	0	..	160	0	0
Swedish Timber, per load	2	17	6	..	3	0	0
Gothenb. Yw. Deals, per 100 12f. 3in. 9in...	17	0	8	..	22	0	0
White ditto	16	0	0	..	18	0	0
Yw. Battens, per hd. 12 ft. 2½ in. 7 in.	11	0	0	..	14	10	0
Christiania Yw. Deals, per hd. 12ft. 3in. 9in.	23	0	0	..	24	0	0
White ditto......	20	0	0	..	21	0	0
Quebec and St. John's Spruce Deals.. per 100, 12 ft. 3 in. 9in.	14	10	0	..	17	10	0
1st qual. yw. Pine Deals, per st. hd.	12	0	0	..	16	0	0
Second do. do.................	8	15	0	..	10	0	0
Third do. do.................	7	10	0	..	8	0	0
Red Pine Deals, per hd. 12ft. 3in. 9in.	15	0	0	..	20	0	0
Red Pine Timber, per load	2	17	6	..	3	10	0
Yw. ditto	2	15	0	..	3	15	0
Birch ditto	2	10	0	..	4	0	0
Elm ditto	3	10	0	..	4	10	0
Oak ditto	4	0	0	..	5	0	0
Standard Staves per mille standard	50	0	0	..	62	10	0
Puncheon Staves, per mille	12	0	0	..	16	0	0

MAHOGANY, &c.

Mahogany,	St. Domingo	5d.	to	1s.	9d. per foot.
	Cuba	5½		1	6
	Honduras	4		1	0
	African	5		0	6
Cedar	Havana	5¼		0	6½
Rosewood.	Rio	12l.		20l.	per ton.
	Bahia.....	7l. 10s.		12l.	

MANURES.

London, February 24.

Guano is more inquired for, all being delivered overside on arrival, in addition to deliveries from warehouse.

Linseed Cakes dull, and little doing.

Rape Cakes more inquiry, and prices firm.

PRICES CURRENT OF GUANO, ARTIFICIAL MANURES, OIL CAKES, &c.

Guano, Peruvian	per ton	£0	0	0	to	£9	5	0
,, In quantities under 5 tons	,,	0	0	0	to	9	10	0
Potter's Guano	,,	0	0	0	to	7	0	0
Peat Charcoal	,,	3	0	0	to	0	0	0
Nitrate Soda	,,	14	10	0	to	15	0	0
Nitrate Potash or Saltpetre	,,	26	0	0	to	28	0	0
Superphosphate of Lime	,,	0	0	0	to	6	6	0
Soda, Ash or Alkali..............	,,	0	0	0	to	9	0	0
Gypsum	,,	1	10	0	to	1	15	0
Coprolite		3	0	0	to	3	5	0
Sulphate of Copper, or Roman Vitriol for Wheat steeping....	,,	27	0	0	to	29	0	0
Salt	,,	0	0	0	to	1	5	0
Bones, ½ inch	per qr.	0	0	0	to	0	15	0
,, Dust......................	,,	0	0	0	to	0	17	0
Oil Vitriol, concentrated.........	per lb.	0	0	0	to	0	0	1
,, Brown	,,	0	0	0	to	0	3	4
Rape Cakes.............	per ton	4	5	0	to	4	10	0
Linseed Cakes—								
Thin American in barrels or bags	,,	8	0	0	to	8	5	0
Thick ditto round..............	,,	6	10	0	to	6	15	0
Marseilles	,,	6	10	0	to	6	15	0
English	,,	7	0	0	to	7	5	0
Ammonia Phosphate (Wakefield and Driffield)	,,	7	0	0	to	0	0	0

WOOL MARKETS.

BRITISH.

LEEDS, Feb. 21.—Many of those connected with this branch of trade being now absent attending the public sales in London, and others again waiting the arrival of fresh stocks, from which to make selection, has caused a comparatively small amount of business to be transacted both in foreign and colonial wools during the past week. Prices are quoted firm from London at the rates of last December series.

LIVERPOOL, Feb. 22.

Scotch.—There still continues only a moderate demand for Laid Highland Wool, at late rates. White Highland is more inquired for. Crossed and Cheviot still continue much neglected; and any few sales going forward will be barely at the quotations :—

		s.	d.		s.	d.
Laid Highland Wool, per 24lbs....		9	0	to	9	9
White Highland do................		12	0		12	3
Laid Crossed	do...unwashed	11	0		12	6
Do.	do...washed	11	6		13	6
Laid Cheviot	do...unwashed	12	0		13	9
Do.	do.. washed......	14	0		19	0
White Cheviot	do... do.	24	0		28	0

Foreign.—The series of public sales are progressing in London very satisfactorily, but as the trade are attending them, we have little doing by private contract; and there are to be public sales here, on the 27th inst., of about 900 bales of fresh imports of Buenos Ayres, also a few East Indian, Egyptian, and Donskoi.

FOREIGN WOOL.

LEEDS, Feb. 21.—There is not any change to report in these markets this week, either as to prices or demand.

Late advices from New York report as follows upon the wool trade :—

"Domestic wool is in good request, and prices of pulled, as also those of fleece, are very firm; and many holders have obtained, within the past three days, a slight improvement on the rates current at the close of the week. In foreign the business doing was not quite so large, but our quotations generally were well supported. The only sale that has come under our observation was one of 200 bales Smyrna unwashed, black and white, on terms not ascertained."

BRESLAU, Feb. 19.—Transactions have been very extensive last fortnight, and embraced chiefly the middling and lower descriptions, which realized full recent prices. The principal purchasers were Saxon combers and spinners, as well as country manufacturers and foreign commissioners. Slipes and skin wool in bundles, at from 50 to 62 thalers, are in great demand but very scarce; lambs' are equally required, but almost nothing of it or store. Our provisions are considerably reduced, and amount at present to only 11,000 cwts. Advices from Hungary state that prices continue in a rising tendency, and that all descriptions are realizing 10 to 15 florins more than at the beginning of the year.—Gunsburg, Woolbroker.

Printed by Joseph Rogerson, 24, Norfolk-street, Strand, London.

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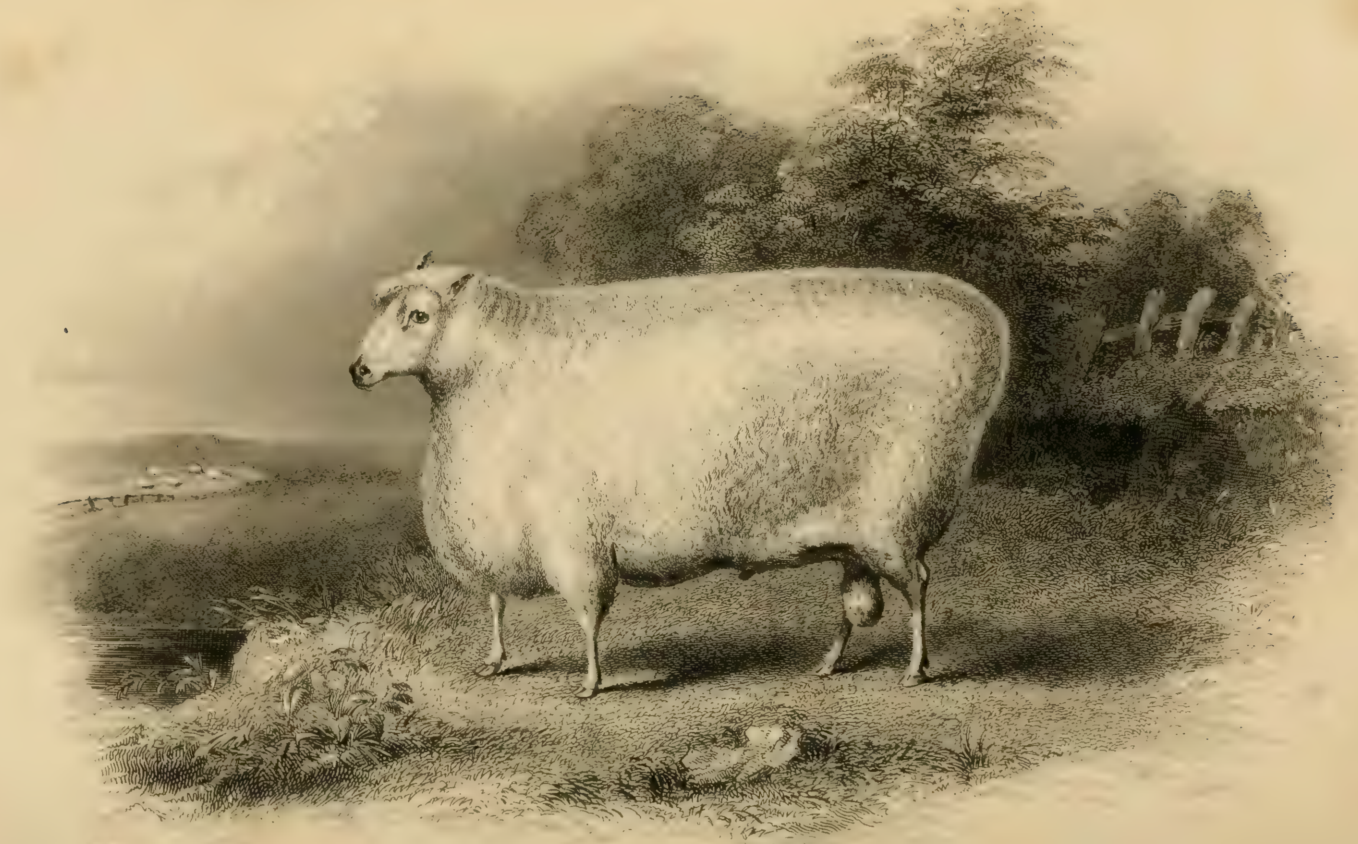

Long Woolled Ram

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THE FARMER'S MAGAZINE.

APRIL, 1851.

No. 4.—Vol. XXIII.] [Second Series.

PLATE I.

A GREY HORSE "LINCOLN."

The subject of the first plate is the property of Mr. Charles Poulton, of Reading, Berks, to which was awarded the first prize of Fifteen Sovereigns, in Class 3, at the Royal Agricultural Society's Show, at Exeter, in July, 1850, as the best roadster.

"Lincoln" carried her Majesty's huntsman for five successive seasons with the stag hounds. He stands 15 hands 3 inches high, and was got by Negociator, dam by Bordeaux, and we understand his "get" are most promising.

PLATE II.

A LONG-WOOLLED RAM.

The subject of the second plate is a Long-Woolled Ram, the property of Mr. William Garne, of Aldesworth, near Northleach, Gloucestershire, for which the first prize of Twenty Sovereigns was awarded at the Royal Agricultural Society's Meeting at Exeter, in July, 1850, as the best long-woolled ram, not Leicester.

DOMESTIC AND CULTURAL ECONOMY.

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON.

No. XII.

I would prefer to incur the charge of repetition to that of omission. A great deal has been ably written on the uses of lime in agriculture; and on several occasions, since one of the best articles that was ever produced on the subject, appeared in *The British Farmers' Magazine* some ten years since, I myself have taken advantage of the knowledge derived from that treatise. In fact every class of cultivators, in field or garden, are deeply indebted to Mr. Rowlandson, of Liverpool, for the scientific proofs which he there adduced of the peculiarly specific power which pure lime (not its carbonate, *i.e.*, chalk) exerts upon humus and humic acid, while combining with the acids, fixing it as an insoluble humate, and thus converting an antagonist of healthy vegetation into a useful and enduring manure. Before I ventured to publish one word on the predominant attractive energy of lime as a meliorator of peat bogs, and soils glutted with humic matter, I tested by every agent and means at command all the leading practical points adduced by Mr. Rowlandson; and then, having proved their truth, I lost no favourable opportunity to impress his theory, believing it to be then not only perfectly novel, but a faithful elucidator of one of the most important qualities which lime, as a meliorator, possesses.

The agriculturists of England know little practically of the enormous quantities of lime that their brethren of Scotland were in the habit of spreading over the land, in proof of which they have need only to refer to the code of the late Sir John Sinclair. It were superfluous to recur to the old and somewhat trite theories by which it was attempted to account for the improvement of land by the agency of quick lime. It was an acknowledged fact that if distributed over the surface it had a tendency to pass down into the body of the soil, and thus to neutralize any sourness which might have been acquired from inert vegetable matter. The truth is that pure lime is soluble to a certain extent in rain water, and therefore must be dissolved, to that extent, by every shower that falls. Now, the solubility of pure lime amounts to about one part in 750 of ice-cold distilled water, and of this circumstance Professor Clark, of Aberdeen, availed himself in his evidence before the "Commission of the Health of Towns," when he proved that by a simple process, lime employed in very small quantity (yet chemically adequate) would, at a trifling cost, remove, almost to its last atom, that chalk which in most cases produces the hardness of water. Chalk (carbonate of lime) is not perceptibly soluble in pure water; but as all natural waters flowing through the earth, as springs, contain the excess of carbonic acid, which confers on them that freshness which is absent from rain and distilled water, it follows that a certain portion of the chalk contained in the ground will be dissolved by that acid, and retained in the state of a bi-carbonate of lime. Therefore if a little fresh-made, yet perfectly clear, lime-water be poured into a much larger volume of hard spring water that curdles soap, one equivalent of the carbonic acid will be seized by the lime, and precipitated as a simple carbonate (chalk); while that carbonate which had existed originally in the spring water, but held in a state of pellucid solution as a bi-carbonate, will be liberated also in the state of free chalk. Water thus relieved from its earthy matter will be rendered comparatively soft—for the purposes of washing; but it may be questionable whether the gardener would derive any material assistance from the process, since the carbonic acid which is present in river and pond water must be entirely removed by the attraction of the quick-lime.

Having thus diverged, it may be as well to pursue the subject of hard-water a little farther. I once was in the habit of visiting large horticultural establishments in Berkshire and Buckinghamshire. Several of these were amply supplied with running water, or by rain-tanks; but two of them, one a large nursery, had to depend chiefly upon hard well water. This was occasionally exposed in tubs a few hours, to the influence of air; but in a thoroughly dry hot summer the calls for water were great and frequent; yet, never did I witness any deterioration in the plants so treated, and in many instances the specimens produced, or exhibited, were superior and most beautiful.

I myself came to Croydon in May 1847—a locality dry by repute, and at that peculiarly arid season parched beyond its wont. The well-water of the vicinity was and is so bad—so replete with not only the bi-carbonate, but with a quantity of gypsum (sulphate of lime)—as to have attracted attention and led to the formation of a local board of health; whose operations promise to furnish the town with an ample supply of comparatively pure and wholesome water. About the middle of May a friend presented a number of strong runner-plants of the British Queen strawberry. These I myself set in a border, a yard apart, with that degree of care and foresight which could alone give a chance of success. There had been five months of dry weather; the first penetrating shower fell on the 7th of May—fine weather returned—the sun's power was very great, and I had to trust to the hard water in question. Fortunately, the soil was fresh from under turf, and very deep. Water was given late in the afternoons, and frequently: now and then a very little from a rain-water tank was taken as by trespass; for the supply to it was absent. Yet I saved my plants, losing only three by the larva of the cockchaffer, that had existed in the turf; and at the usual season, after the midsummer rains, runners in such numbers were produced as to furnish me with a very ample supply. I can adduce these circumstances as an irrefragable proof of the safety and efficiency of *very hard* chalky water. The digression I hope will not be without its uses.

Next in importance to the great announcements made by Mr. Rowlandson, mentioned above, is the position which lime occupies in the soil, as a chemical agent, to effect those silent mutations by play of affinities, that were brought to light by the researches of Messrs. Thompson and Way. Some lime therefore, perhaps in a quantity so small as to escape detection by any strong acid, must exist in a soil, otherwise manure cannot perform those functions of nutrition which are brought into activity by what is termed its fixation. Every one of the very numerous experiments published in the *Royal Agricultural Journal*, vol. xi., date 1850, bears upon this great and novel discovery. Again, the validity of those lucid experiments has been established by results obtained at home (and I trust elsewhere by others), which leave no doubt that lime in one form or other is expelled from fertile soils, whenever any manure becomes united therewith. Here we must avoid anything like conjecture as to causes, till further experiments throw more light upon the path of philosophical inquiry.

In the 610th page of the *Edinburgh Journal of Agriculture*, January, 1851, there is an extract from a French work on lime, portions of which I venture to introduce; for, as the reviewer says, the book contains sensible remarks amidst "a great deal of nonsense."

1st. The attraction of lime "for carbonic acid is so powerful, that if lime be placed in contact with animal or vegetable matters, they are decomposed with great rapidity for the purpose of obtaining it." The reader should repudiate this error—the direct and strongest affinity of hot lime is for water, not for carbonic acid; hence it chars or burns those matters, by attracting their watery elements. Some carbonic acid may then be attracted after the lime has been converted to a hydrate (slaked).

2nd. "It produces equally good effects, and for the same reason, in soils newly broken up—in fact, in all soils rich in vegetable matters. When this powerful decomposing action of lime is known, the necessity for caution in applying it upon land about to be sown becomes apparent." Mr. Rowlandson here steps in, and elucidates the true action of lime upon vegetable matter.

3rd. "We cannot too strongly insist upon the fact, that the use of lime does not enable the farmer to dispense with the use of manure; on the contrary, the more lime is used so much the more manure is necessary." Good—converse the proposition, and then apply the deductions obtained from the new analytical discoveries, all of which prove the expulsion of lime by the action of manures.

4th. "It appears to be clearly established by the experiments of M. Fuch, and of Liebig, that this substance has also the property of setting at liberty the alkalies which are present in exceeding small quantities in the soil, favouring the formation of soluble silicates which are so useful to the cereals." I am not prepared to decide, from experiments, whether the last remark be chemically correct or not. Lime, according to Professor Way—expts. No. 51-2-3-4, with lime-water, passed through earths of three kinds, was thereby arrested in consinerable quantity. On the other hand, caustic potash, and its carbonate, were equally arrested; while a solution of saltpetre (nitrate of potash), 100 grains in 5000 grains of water—filtrated through a soil containing 5.94 per cent. of lime—lost its base—potash—which was detained; the nitric acid passing through the soil combined with lime as a solution of nitrate of lime—see expts. 46 and 47 (*Roy. Ag. Journ.*, vol. xi., 333-335). Here we obtain a key to a part of the mystery; and the utility of analytic chemistry to agriculture and gardening is no longer questionable.

METEOROLOGY: ITS CONNECTION WITH THE CULTIVATION OF THE SOIL.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

It is within a very recent period that the influence of climate upon the productions of the cultivator of the soil has been steadily noted, and carefully traced. This inquiry is of far greater importance than is generally supposed. Its interest is not confined to the mere watchings and records of the meteorologist, or to his endeavours to trace systematic results from phenomena as varying as the wind, and influenced by as many causes. Such investigations lead to more certain and more practical results. They serve, among other uses, to warn the farmer, of one side of our island, against attempting the cultivation of wheat as a profitable crop in such of its districts where the fall of rain is above a certain average, or its summer mean temperature below what is found to be merely sufficient for the proper ripening of the seed. Such careful observations serve to explain why the skilful Scotch farmers do not always successfully compete with the denizens of a southern climate, and why the agriculturists of the east of England are as frequently unable to profitably introduce the Norfolk husbandry into the far moister climate of the west. These are only one or two practical applications of the science. Other suggestions will arise as we proceed; thus it has been shown, for instance, that the low mean temperature of a season is almost inseparably connected with a low average production of corn; that a fall of rain exceeding the mean average produces a similar effect; and that, consequently, there is a more close connection between the phenomena of meteorology and the value of agricultural produce than we are always patient enough to consider. Upon the whole, then, I feel well assured that the fact I have to produce will well repay the reader for the time and attention he bestows upon them.

It is, however, in this as in most studies, of very great importance that the student discard from his mind as much as possible all his preconceived conclusions; that he commence the study resolved to regard chiefly the results obtained from the rain gauge, the thermometer, the hygrometer, and the barometer, and the influencing causes in which these may be placed; that he should be prepared to find that in different districts of England the mean depth of rain may vary from 20 to 60 inches; and that in some places this depth of rain has a still wider range to the very same place, only at different elevations. By thus being prepared to discard the errors of the imagination, the introduction of truth will be accelerated, and useful knowledge far more readily attained.

Let us commence by taking a general view of the phenomena of cultivation as influenced by the climate of the British islands. Beginning then our observations from the southern side of the island, it will be convenient to travel in a straight line towards the north, and afterwards in transverse lines towards the west and east.

A stranger landing on our island on its southern shore—at Southampton, for instance—and proceeding through its centre in nearly a direct northern course, would speedily remark, as he advanced, a gradual but very considerable alteration in the appearance of the soil, and the nature of its agricultural and other productions. He would notice, in the first place, that the wheat, barley, and oats, the growth of the southern portion of the island, were not only large in extent, but excellent in quality; that the flour produced from the wheat seeds was dry and starchy; that this wheat was ground by the miller with little difficulty in ordinary seasons, and made into excellent bread without admixture with other wheat from drier and warmer districts. Grass lands or natural pastures he would find, there, limited in extent; or if locally large, chiefly producing a short herbage, best adapted to the pasturage of sheep. As such a traveller progresses towards the north, he finds a gradual and steady alteration in the productions of the cultivator of the soil. By almost imperceptible degrees the extent of the barley and the wheat crops decreases; natural grass lands take their place, and these support cattle, as well as sheep: he soon finds himself, in fact, in a more grazing district. As he still advances northward, less and less wheat and barley occupy the soil; more and more oats take their place: rye in abundance begins to make its appearance. The seed wheat here grown is described by the miller as being "cold" and "clammy." It is materially aided, he finds, in grinding, by admixture with such wheat as is the produce of more southerly districts.

The grass fields now occupy the majority of the soils. Dairying is a chief agricultural operation—sometimes for the production of cheese; at others for the making of butter. The live stock is here pretty generally fattened for the butcher. This progressive change, with occasional exceptions in the case of small districts peculiarly circumstanced, still continues as he advances towards the borders of Scotland, and attends him in his course through that portion of the empire, until he approaches its northern extremity. There indeed he finds at last the growth of wheat only very partially attempted: oats and rye chiefly occupy the arable soils; small and lean cattle are now seen depasturing on the grass lands. The general aspect of nature is in accordance with these changes in the farmer's productions. The trees which he beheld adorning the hedgerows have gradually altered since he began to traverse the island. The oaks, the elm, and the Spanish chesnut of the south have, during the voyage I have traced, been supplanted by the larch and the birch. Stone walls have taken the place of the luxuriant hedgerows of southern England.

Such are some of the natural phenomena presented to the observing traveller, in the course of his northern voyage. Other natural appearances, however, would not escape his observation. He might, amongst other things, have occasion to note that, with few exceptions, as he traversed this district, he was exploring the great centre ridge or backbone of the island; that as a natural consequence nearly all the rivers on his right side ran towards the east, implying a gradual inclination of the land in that direction, whilst the very opposite state of affairs presented themselves on his left, since there the general inclination of the land, and consequently of the streams, was towards the west.

These being the general outlines of the observations to be made during such a northerly tour, in the course of five or six hundred miles, or nine or ten degrees of latitude, it might next suggest itself to such an inquirer to examine and ascertain the effect of longitude, as well as latitude, on the vegetable productions of the island. In other words, he might diverge from the northern and southern line I have before described, and travel in a line or lines from east to west. In this course a new state of affairs, at least in the southern portions of the island, would present themselves. Starting then from the centre point or line I have described, he would very generally find, as he travelled towards the east, the growth of corn more and more occupying the attention of the farmer; luxuriant crops of all cereals abounding; artificial grasses extensively supplying the place of natural meadows, which he would here meet with chiefly by the banks of rivers, on lands commonly too moist for the successful cultivation of corn. If, however, he travelled in exactly the contrary direction, and advanced towards the west, he would remark a very different state of cultivation. Decreasing cereal crops he would here note to be gradually giving way to the natural grasses. He would find cheese and butter carrying to market by the landholders instead of corn; the breeding and fattening of fine varieties of cattle occupying the attention of the farmers of the better soils, and smaller breeds of lean stock occupying the inferior lands. In fact, the traveller would note that on the western sides and slopes of the island the nature of the farming, and the productions of the earth were almost as different, although within about 200 miles, or only three degrees of longitude, as those which he had witnessed in his progress through the ten degrees of latitude which occupied him in his northern tour.

For such an explorer it might be naturally suggested that, for the rational explanation of these great and general variations in the agricultural systems of the land, something more than the different nature or chemical composition of the soil was needed. For instance, that to some other cause than the siliceous nature of their soils must be attributed the general growth of barley on the sands of Suffolk and Norfolk, and the equally common devotion of the sands of Cheshire and Lancashire to pasturage. To tell him that it was the "custom of the county," which is the common remark, he would feel was merely the statement of the fact, involving nothing which tended to explain it. If, however, the suspicion arose that this might be accounted for by reference to the varying supply of moisture, or other meteorological circumstances with which these different sides of the island were attended, the natural result would be that such an inquirer as I have supposed would be anxious to be furnished with a few data which might assist him to arrive at a fair conclusion. May the meteorological facts, which I shall now proceed to trace, aid such an investigator in his useful researches, and serve to illustrate some of the important phenomena to which I have referred. I propose, then, in future numbers of this valuable magazine, to commence with the examination of the rain-gauges, and other records of the aqueous phenomena of our climate, and then proceed to notice the varying temperature of different localities.

The practical application of our meteorological observations will be speedily apparent as we proceed. As I remarked on a former occasion:—The examination of the operation of heat upon animal and vegetable life, is a research of very considerable interest to the tiller of the soil; for a knowledge of the influence of heat and moisture upon living substances (modified as those effects are by so many ever-varying circumstances), renders many of the processes of agriculture more easily understood, and serves to suggest new or improved farming operations. The chemical philosopher, indeed, is well aware what great results are produced in this globe of ours by the presence of heat, and how disastrous would be the consequence of its withdrawal: for life, both animal and vegetable, must, in its absence, be extinct: the ocean, and all other waters, a mass of ice. Even the Greek philosophers had, in some way or other, arrived at a knowledge of its importance, for they ranked fire as one of the four elements of which they deemed the universe to be entirely composed. The intelligent modern cultivator is also well aware of many of the effects of heat upon plants, and how varying is the action of the same degree of temperature on different soils, and even on the same soil when differently placed; that some crops which only suit particular kinds of soil, languish on others whose temperature is different, in spite of all efforts of the farmer, however skilfully directed. Those, for instance, where the bean is so profitably cultivated, he tells you, are "too cold" for barley; and those, on the contrary, where the turnip flourishes so well, are much "too hot" for the luxuriant growth of the bean-plant. Other lands, he well knows, are exposed too much to particular winds; others are situated on elevations too considerable; others are too low down in the valley for the pro table cultivation of crops, which, in other situations flourish so well. "The crops," says Mr. John Morton, an excellent modern farmer, in his valuable work *On Soils*, p. 216, "are never so good or so early on cold tenacious clay soils, on the gritstone formation, or on the moorlands in Yorkshire, at the elevation of 500 feet, as they are on the chalk wolds in the same county at 800 feet high. This difference gives to dry calcareous soils a very great advantage. In England, land at an elevation of 3000 feet above the level of the sea becomes unprofitable to the arable farmer, as the crops do not ripen, except in very particular seasons; and therefore it ought only to be used as pasture at such an altitude.

We have noticed how much the cultivation of plants is influenced by the meteorology of a district. Nature has showered her seeds in accordance with the same phenomena; multitudes of plants, long since remarked M. Merbel, are spread over the surface of the globe, each having its pecular wants, and, if we may be allowed the term, its separate habits and instinct. Some species belong to the mountains, others to the valleys, and others to the plains; some affect a clayey soil, some a chalky, others one of a quartoze nature; while many will thrive in no place but where the soil is impregnated with common salt. There are some that confine themselves entirely to water, dividing themselves again into those of the marsh, the lake, the river, and the ocean. Some require the hottest climates, others delight in mild and temperate ones, others thrive nowhere but in the midst of ice and frost. A large portion must have a constantly humid atmosphere; several do very well in dry air, but the major part are equally averse to the extremes of both dryness and moisture. There are those which flourish when exposed to the action of a strong light, while others prefer the weaker action of that element. The result of this variety of wants is that nearly the whole surface of the earth is occupied by vegetation.

ON CULTIVATED PLANTS, AND THEIR AGENCY IN MAINTAINING THE BALANCE OF NATURE.

BY M. M. M.

(Continued from page 104*).*

Look at the powers of reproduction. Take first the animalculæ; the family of one individual is said to be 1,000,000 in ten days, 4,000,000 on the eleventh, and 16,000,000 on the twelfth. The female of the termite, or white ant, produces 40,000, the bee from 5,000 to 6,000 in a season. The herring produces many thousands, and if only 2,000 of these were to come to perfection, there would be in the second year 12,000,000, and in the third year 2,000,000,000. The tench produces 38,000 eggs; the mackerel 546,000; the cod fish 1,357,000. Nor are the varieties of plants, nor the reproductive powers, less wonderful. There are 92,000 ascertained species of plants; and a single plant of barley has been known to produce 20,000 grains; the sunflower has 4,000 seeds; the poppy 30,000; the tobacco plant 40,000. An elm tree, 12 years old, produces 164,500 seeds. Then the provisions for the dissemination of seeds! To some wings are supplied, by which they may be wafted on the winds to places far distant from their parent stem; some are provided with a boat, in which they can sail to distant coasts; some plants burst their maternal cell, and are discharged with violence to a distance; some, again, are furnished with a saw-like awn, which lays hold on any substance, and by the expansion and contraction of its parts gradually moves each grain away from its common centre.

Now imagine, if possible, the wonderful design in preventing any of those from overrunning their proper limits, and still preserving their existence and station in the earth. And this wonder only increases when we calculate how dependent animals and plants are on each other, and on themselves respectively. If plants were to fail, the herbivorous animals could not exist; and if herbivorous animals die, there will be nothing for the carnivorous to feed upon.

Plants, we have seen, feed on carbonic acid—their structure is composed mainly of carbon—and in 14 years, if none were supplied, they would absorb the whole. But see the admirable provision. The burning of carbon excites heat. The system of animals is a machine for burning carbon, and animal heat is the result. They consume the carbon as starch, as sugar, as gum—the oxygen of the air is breathed into the lungs and burns it; and while the combustion of the carbon keeps up the animal heat in the system, it passes off from the lungs in the state of carbonic acid, and thus a constant supply of the acid is going on, to be again taken up by vegetables, and again to supply animal wants.

Though the principles necessary to sustain flesh are abundant in the air, in the soil, and in water, animals have not the power of assimilating it directly. Vegetables possess this power; they seize the simple bodies of nature, and convert them into those substances necessary to the use of animals; and animals give back to the air, to the soil, to the water, these same elements in their more simple state, in an untiring round, and thus wonderfully keep up in the circle the balance of creation.

The relation of carbon to the wants of plants is constantly sustained. One man, for instance, is calculated in a year to breathe in the carbonic acid expelled from his lungs 112lbs. of carbon. Taking 20 millions of men as our population, at 80lbs. each, and animals at twice as many, or 40 millions, they will in the year respire 2,100,000 tons of carbon, which would supply sufficient carbon for 4 millions of cultivated acres of plants. There are, however, 34 millions of acres in this country, and it is calculated that seven-eighths of the carbon necessary to sustain the crops growing upon these is supplied by the consumption of coal alone. Nor is this all. Decay of dead matter, animal and vegetable, causes the evolution of carbonic acid, and of ammonia. Flesh cannot be formed without ammonia, but as such it cannot be taken into the system. Plants need it to form their structures. At the death of both it is liberated, brought down by the rains, taken up by the plants, and so fitted to nourish and to form the flesh, and bone, and nails, and hair of the animals, and thus a given quantity of ammonia is constantly supplying the one and the other; and we are now holding in the organization of our bodies the same materials as built up the structures of our ancestors.

The same rule applies to the phosphate of lime, the sulphuric acid, the potash, and the soda, which constitute the inorganic portions of plants on the one hand, and of animals on the other.

And now for the influence of cultivation. Man requires whole districts of wheat, of turnips, of potatoes—he extends their cultivation far and wide—he stimulates their growth by all the resources of science, and by all the appliances of art, and so far he is a disturber of the balance of created beings: but beyond a certain limit he must not go. The same wonderful provision which provides against the extinction, provides also against the undue extension, and hence his wheat has the rust and the mildew, the smut and the ergot. The growth in too great abundance of the one encourages a corresponding stimulus of its natural enemies, and thus it is subject to a process of thinning. The wire-worm, the wheat fly, and the caterpillar, appear in swarms corresponding with the food they naturally consume.

Diseases sometimes effect what insects do not. The turnip when extended as a crop is preyed upon by the caterpillar, the maggot, and the aphis; and the potato is too well known to be subject to visitations of the curl and the dry rot, the blight and the murrain. Our forests of oak, and our evergreens and fences, bring the same evidence of a system at work—of checks to excessive extension.

Permit me, in conclusion, to allude a little more specifically to the details of this beautiful arrangement. The seeds of wheat are put into the ground, but all do not grow. Why is this? The wireworm feeds upon some of it, and we look for our plants in vain. But will not the wireworm soon create a famine? No. The insectivorous birds—the wagtails and the swallows—will find additional food, and increase accordingly; but will not, it may be asked, these outstrip their bounds and become an annoyance? No such thing; the plenty of them will supply food for additional owls and sparrow-hawks, and thus these will be encouraged, until, if they exceed their legitimate limits, they also will perish for want.

Take again the *plant* of wheat as I have taken the *seed*. It is liable to be attacked, as I observed, by the Hessian fly, and this is observed especially of the vast corn plains of the American continent. The consternation this visitation produced was terrific; but mark the inscrutable ways of the great First Cause. A parasitic insect fixed upon the Hessian fly, and kept it in its proper limits. And this is the case with the hop aphis, which is followed by its natural enemies precisely in proportion to its own extension.

There is another disturbance of the balance to which I will only just allude. The miracles of the plagues of Egypt were evident disturbances of the balance. The frogs in the king's chamber, and in the kneading-troughs—the flies in all their quarters—the very grievous murrain—the smitten barley—and the locust-eaten grass—were all miraculous deviations (as all miracles are) from the order of nature, and as such ought to be regarded. But even here the miracles themselves were of a compensating and balancing kind. It was when the grass was destroyed, that the cattle were killed; when the corn was burnt up, that the first-born perished; and when the sustenance of man was so diminished, that the horse and his rider were cast into the sea.

And while the review of the whole subject should induce us all to realize the conviction that while our universe is not too infinite for the omnipotent Architect of all to direct, the minutest part of the whole is not too insignificant to escape his omniscient cognisance; and while we see the providential care exercised by a Parent good as he is, and are led by it to adoration and to love, let us not forget that those who love him, should manifest a spirit of kindness, forbearance, and sympathy to each other, and thus—

"The centre mov'd, a circle straight succeeds;
Another still, and still another spreads:
Friend, parent, neighbour, first it will embrace;
His country next, and next all human race.
Wide and more wide, the o'erflowings of the mind
Take every creature in, of every kind;
Earth smiles around, with boundless bounty blest,
And heaven beholds its image in his breast."

In illustration of the above principles the writer gives the difference between the air of the atmosphere and respired air, *i.e.*, that which has passed through the lungs of animals.

	Atmospheric air.	Respired air.
Carbonic acid	0.04	4.00
Oxygen	20.80	16.84
Nitrogen	79.16	79.16
	100.00	100.00

The relations between wheat, flesh, and the soil, as regards their chemical constitution are very remarkable, and in illustration of these, and of the constituents of sugar and starch in relation to their elementary composition, the following table is affixed:—

	Starch.	Gluten.	Wheat.	Flesh.	Soil Fertile.
Carbon	44.0	52.9	46.1	51.83	97.00
Hydrogen	6.2	7.5	05.8	7.57	
Oxygen	49.9	28.9	43.4	21.37	
Azote		15.7	0.23	15.01	
Potash			12.44	2.56	2.00
Soda			0.16	27.8	4.00
Lime			6.70	2.50	59.00
Magnesia			3.82		8.50
Oxide of iron			1.30	8.28	61.00
Phosphoric acid			3.07	13.18	4.50
Sulphuric acid			5.82	2.71	2.00
Chlorine			1.09	38.8	2.00
Silica			65.38		648.00
Alumina					57.00

AGRICULTURE AND THE RURAL POPULATION ABROAD.

[FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.]

FRANCE.—No. V.

Mettray.

The name of Mettray—which locally distinguishes a pleasantly lying tract of fertile land some five miles north of Tours—has gained a European celebrity as the site of a most philanthropically conceived, and wisely and ingeniously framed establishment for the reformation and industrial training of deserted and *quasi*-criminal children, drawn to this common centre from all the penitentiaries and *maisons de detention* of France. In England we have nothing in the slightest degree resembling Mettray; and with the exception, indeed, of institutions modelled more or less upon its plan, it stands alone in Europe—a masterpiece of moral ingenuity.

The founders of Mettray—the two originally minded and philanthropically devoted men, who conceived, planned, and executed the great work, and who are still its unwearied directors and guiding spirits—are M. le Vicomte de Brelignères de Courteilles and M. Demetz, both of them gentlemen who had long previously applied themselves with remarkable energy and ability to the study of the subject of prison discipline as connected particularly with the reformation of young offenders. Through their iufluence, an association called *La Sociéte Paternelle* was founded, its object being to exercise a benevolent guardianship over children charged with crime, but acquitted as having acted without discernment or guilty intention. Of such children the French law authorizes the detention for a certain term in great industrial prison establishments, under a system of harsh and rough discipline, from which they are dismissed without any systematic attempt at moral reformation or moral instruction having been made, but with the brand of gaol-bird stamped upon them all. The object of Mettray is to receive such of these children as are deemed most eligible, and to subject them during their terms of detention to a system of discipline founded essentially upon moral influence, and upon a constant appeal to the sense of honour and justice instead of fear. The great feature of Mettray is, that it dispenses with all the disciplinary forms and appendages of a prison, while it exercises just as strong and firm, though a much kinder and more considerate control. The establishment is provided neither with gaol locks, bolts, nor bars. Its gates stand wide open to the fields, and the children frequently proceed—always of course, under proper guardianship — to their daily labour among the hedges and the woods. It must not be imagined from this that no virtual, because no apparent, means are taken to prevent flight. The very system of discipline in use, involving as it does constant surveillance, is the principal restrictive power employed; but it is a power which would be almost inoperative were it not based upon those moral influences to which I have alluded, and which constitute the true bolts and bars of Mettray. Nor is this appeal made to a too elevated tone of feeling. Honour is defined by one of the writers on Mettray to be a sort of ticklish alliance between conscience and vanity. The children would at first care very little about commiting a sin, but they instinctively shrink from enacting a piece of cowardice. Thus, then, the question is put to them, "Here are no locks or walls—will you escape?" The virtual and practical answer is "No; there would be no honour or bravery in doing what could be done so easily"—it being, however, as I have already explained, perfectly understood not by the children perhaps, but by all the world besides, that these facilities for flight are more apparent than real. Both views of the matter are confirmed by the fact that very few attempts at escape have ever been made, and that not one of these has been successful. Thus, then, by imposing moral instead of physical restraint, the *détenus* are prepared for the full liberty which ultimately awaits them. So much for one feature of Mettray.

The next principal influence sought to be cherished is the spirit of family attachment. In the nature of things it is obvious that this task can only be achieved approximatively. The method employed is as follows. The children live by forties and fifties in distinct houses, each under the superintendence of a *chef de famille*, seconded by a *contre-maître*. In whatever *atelier* they work they return to their family house to eat and sleep. Housemates are encouraged to call each other brothers, and each household elects two "elder brothers,"who serve as *aides-de-camp* to the *chef* and the *contre-maître*. To a certain degree, also, the children are permitted to decorate and adorn their eating and sleeping rooms after their own fashion, so as to produce a degree of individuality, and to get rid of a cold and systematic uniformity. In various other ways the feeling of family is sought to be developed, and even such melancholy events as occasional deaths are made subservient to the work of fostering this leading idea. Thus, when a child dies, his housemates alone follow him to the grave.

Mettray is very often talked of in England as if it were exclusively an agricultural seminary, possessing a model farm. It neither is nor has any thing of the kind. The children are trained to a number of trades—principally, however, those connected with the wants of a country life. Two-thirds of them are certainly brought up as cultivators of the soil, but they are not taught upon any other system than that pursued in the large farms of the country. Mettray does not pretend to possess either model implements or model stock, or to grow model crops. The object in view is rather to make honest and industrious than scientific farmers, and the whole code of discipline, industrial and scholastic, is founded upon the idea of producing an orderly, well-disposed, religiously minded, and sufficiently instructed rural community.

Each child when he leaves Mettray is placed by the society in a situation suitable to his education and capabilities. Great pains are taken to preserve the links between him and the establishment to which he owes so much. The society, through its officers, corresponds with him, advises him, and receives regular reports as to his progress and conduct; the substance of each of the latter being regularly posted up in the school-room, and from time to time read to the children, as matter either for imitation or warning.

I have thus recapitulated the leading ideas sought to be carried out by the institution of Mettray. It remains to sketch its material arrangements, to indicate the daily routine of its discipline, and then to subjoin a few statistical details as to its results. The buildings of the colony occupy three entire sides of a large square, laid out with grass beds and gravel walks, and furnished here and there, round a ship's mast—of which more hereafter—with a small gymnastic apparatus. At the head of the square stands the church, a neat and unpretending structure, crowned with a slender and elegant spire. On each side of the church, but leaving a small open space down its sides, are buildings containing the school, the library, a small museum of agricultural models, and the apartments of certain of the *employés.* Behind the church, and encircled by the buildings which constitute the necessary erections of the farm-yard, is the small prison for refractory *détenus,* consisting of a series of cells, so arranged that their inmates can see and hear what passes in the chapel. The barns, the byres, the stables, the cart-sheds, the dairies, the pig-sties, and the poultry-yards, are arranged in excellent order in the rear—their general disposition being that of an irregular and broken square, enclosing the principal manure-yard in the centre. Running at right-angles to the upper or church side of the square are the two corresponding rooms of *Maisons de Famille.* They are placed with their gables towards the square, have long overhanging eaves like Swiss houses, and are connected by a wall behind, from which projects a light timber roof, forming a series of sheltered play-grounds. Each of these houses is composed of a ground floor and two upper stories. The former constitutes the *atelier,* or workshop, the latter the eating and sleeping-rooms of the inmates. The workshops have for the most part nothing to distinguish them from the ordinary working places of carpenters, shoemakers, or tailors. A few, however, are partitioned to such a height as to allow the *chef d'atelier* to superintend the operations of his pupils without the latter being able to see their comrades enclosed in the other partitions. The rooms above serve by turns as refectories and dormitories. Dinner-time comes. Board planks, working upon hinges along the walls, are let down, and the tables are ready in a moment; the arrangement leaving clear passages for the inspectors and *chefs.* A rainy afternoon ensues. Up go the planks, and the apartment is as clear as a ball-room for play and frolic. Bed-time comes. Another system of moveable woodwork is put into operation, and supports are ready, to which each *détenu* hooks his hammock, which is during the day-time rolled up and fastened to the wall. The hammocks are ranged transversely across the room, in two ranks, the boys sleeping alternately with their heads and feet to the wall. In this way conversation is prevented, and *surveillance* made more easy. Over each hammock is a shelf, containing the small wardrobe of each *détenu,* his hair-brush and comb, his Sunday trowsers and blouse, and his Sunday shoes. He wears sabots during the rest of the week. The *chef de famille* sleeps in a little alcove at the extremity of the room, where he can see without being seen. He is assisted by his *contre-maître,* or *sous chef,* and, if need be, by the *frères ainés,* elected by the household from their own number. Each of the houses is inscribed with the name of a benefactor to the institution, except that appropriated to the youngest boys, which is placed under the guardianship of "*La Sainte Vièrge, la Mére des Abandonnés.*"

At the foot of the square, so to speak, and partially enclosing its fourth side, are the houses of the principal superintendents. Thus is formed the chief structural establishment of Mettray; but this is not all. Separated by a cross road from the main institution is an important appendage to it. This is a range of building, partly enclosing a flower and kitchen garden, and containing on one side the bakehouse, the kitchen, the laundry, and the store-rooms; and on the other, the infirmary, the surgery, the apartments of the excellent sisters who take charge of the cooking, the washing, and who act as sick nurses, and also the training school, in which the *contre-maîtres* are initiated in their duties, before being entrusted with their performance. These young persons are generally the sons of creditable families in the neighbourhood. On entering Mettray they place themselves under a system of discipline perfectly analogous to that undergone by the *détenus* themselves—a system which, "without being that of the cloister, of the college, or of the regiment, partakes of all three." The aspirants to the post of teachers and guardians at Mettray are subjected, before being appointed, to a rigid examination, and the duties and responsibilities which they then undertake are of such a nature that few young men, except those characterized by a temperament of no common earnestness, self-denial, and enthusiasm, would be likely to seek them. The *chefs* and *sous-chefs* are, as I have said, assisted by two *frères ainés,* elected once a month by the family amongst themselves—the choice being accounted a great honour for the individual upon whom it falls.

So much for the physical and material part of the work. I now come to the discipline, and the moral and industrial system pursued. The directors themselves usually choose the children deemed most eligible for Mettray from the different *maisons de detention* in France. On the boy's arrival at the colony he undergoes an examination into his parentage and former mode of life. The particulars are carefully registered, and beside them are afterwards added the history of his after career in the colony, and when liberated and placed in service. Without trenching here upon another portion of the subject, I may mention that up to January, 1850, out of 528 children received into the institution and afterwards provided for—

43 were foundlings.

46 were step-children.

222 were orphans.

106 were illegitimate, the children of parents not living together.

18 were illegitimate, the children of parents living together, but unmarried.

142 were children born of parents of notoriously bad character. And

77 were children, both of whose parents at the time of their apprehension were in prison.

I have before me a number of the examinations to which the children were subjected. The common result is a sad story of thefts committed either from hunger or at the bidding of parents. Many of the children arrive in the most deplorable state of health, scrofulous affections being particularly common—while those who come from the far rural districts, and who have been all their lives employed in the solitary watching of cattle, are described as being little removed from the brutes with whom they have herded, yelling and butting with their heads on the slightest provocation. I am informed that on the first entrance of the children at Mettray the change in the plan of discipline is anything but liked. They cry to be taken back to the Penitentiaries, where they were accustomed to crowd all day round a warm stove, telling each other stories, and making use of what language, and playing (in certain respects at least) what tricks they pleased, without dread of continual punishment. The irksomeness of unaccustomed labour, however, soon appears to wear off, and even the most obstinate recalcitrants yield before a week's solitary confinement—not in idleness, be it remembered, but kept well at work during the whole period beating out heads for nails or breaking stones.

The first plunge then over, the following is the routine of daily labour and instruction at Mettray. At five in summer and six in winter the *détenus* rise. Prayers are said in each family. Then the whole body of the inmates are mustered in the square. The workers in the different *ateliers* form into divisions and one long double line, when they are inspected by the *employés;* and then, with military precision, at the word of command they march to their respective workshops, to a lively air played by the cornets-à-piston belonging to the brass band. Labour then commences, and goes on until eight o'clock. Half an hour is then allowed for breakfast; then comes three hours of work, then an hour for dinner and recreation; then, in summer, instruction in the school-room, for two hours during the heat of the day; then work until eight o'clock, after which supper, prayer, and the evening hymn. To-bed at nine. In winter the plan is slightly different. The hour for rising is six, and the school hours are arranged so as to fall after dark.

The regular meals are three, consisting chiefly of bread and cheese, and soups and stews of vegetables. Twice a week only meat is given, either bacon or beef. For drink the *détenus* have water, or *boisson*—water just stained with red wine. Among the trades which the boys are taught, those more or less appertaining to the *ménage* are of course not forgotten. Thus, under the superintendence of the *sœurs,* boys learn the rudimental part of cookery at the same time that they send up their comrades' dinners. They bake the bread under the direction of an experienced workman, and they are made gardeners while they raise the pot-herbs required in the kitchen. The ordinary domestic work of each family is performed by each of the *détenus,* week about. During that period they are released from the work of the *atelier,* but of course attend school as usual. The list of their daily duties is posted up in each eating and sleeping chamber. As a general rule, the employment of a boy in such domestic work as cooking, baking, milking, and so forth—in the exercise of functions, in fact, in which he is immediately useful to his companions and to the establishment—is held out as a species of distinction—a kind of prize, and is, as such, valued by the *détenus.* Gratitude and a strong desire to be directly useful to the institution, are feelings which the directors appear to have been very successful in exciting.

In arranging the plan of discipline, the authorities of Mettray acknowledged that they were somewhat embarrassed how to proceed as to the Sunday. The puzzle was how to combine the sacred repose of the day with those employments or exercises which might best prevent the dangers arising from listless inactivity, having regard to the moral condition of the *détenus.* The first day of the week is now spent as follows:—The children first attend service in the chapel; afterwards a simple moral lecture is delivered by the chaplain, and usually one of the directors addresses the juvenile audience again during the day. The forenoon is spent in the learning and the practice of choral music. A brass band has also been formed—the directors being happily proof against the objections brought to teaching children in the position of those at Mettray accomplishments, as it has been alleged, of so unprofitable a nature. After these performances come a variety of semi-military evolutions, in which the children are regularly trained, with the view of imparting to them in future life a brisk erectness of carriage, and a quick decision of step—personal qualities constituting a great improvement, as the directors most truly affirm, upon the lounging gait and slow clownish movements of the ordinary French peasant. Two hours of the Sunday afternoon are appropriated to gymnastic exercises. For, in a large yard before the infirmary, a gymnastic apparatus, in great variety, has been erected, the best and most healthful mode of using which is taught by the *contre-maîtres,* who have been regularly instructed themselves. A useful portion of the gymnastic exercises taught is the management and working of fire-engines. Upon several occasions of fire in the neighbourhood, the *détenus* gave the most effective assistance.

No attempt is made in the school-room at Mettray to convert the children into phenomena of parrot-learning. They are taught simply to read, write, and cypher. The instruction sometimes takes place in the general class-room. Sometimes the principle of the family is carried out in this respect also; and the *détenus,* after having been taught for some time in their several houses, are brought into mutual competition—family against family—in the general school.

When a boy arrives at Mettray, if he is of an age to be likely to have a choice in such a matter at all, he is allowed to select the trade which he is to follow. The children who are too young to be entrusted with this privilege, or who appear to have no particular wishes upon the subject, are put into the agricultural brigade, and are employed in such light and simple field or farm-yard work as they can manage. In the report of 1847 the numbers then pursuing each occupation were stated to be as follows: — Agriculturists, 335; gardeners, 50; wheelwrights, 18; blacksmiths, 12; farriers, 10; sabot makers, 16; carpenters, 12; tailors, 18; shoemakers, 12; masons, 6; ropemakers, 8; sailors, 3.

The authorities have hit upon an ingenious plan to prevent wanton changes from trade to trade. No boy who asks to be placed in a different *atelier* from that originally assigned to him is refused; but he is told that, before his request can be entertained he must have become one of the three best-behaved in his family, and must have his name inscribed in the list of honour—a distinction to obtain which it is necessary that three months should have been passed without the *détenu* having been subjected to any, the slightest, punishment. The consequence usually is, that the boy sets to work with redoubled zeal, and presently attains the required qualifications. But in the very act of doing so he has conquered the principal difficulties of the trade; he finds himself actually earning a small surplus, which is being laid up for him in the savings bank; and, flattered by the praise which he receives, and by the influential place, so to speak, which he has cut out for himself, he quite changes his mind as to an alteration of trade, the natural consequences of which would be a repetition of the drudgery and irksome work which he has just managed to struggle through. It is stated, however, that few of the children remain tailors; but in their short career on the shopboard they acquire a facility in mending and patching clothes, well calculated to be valuable to a labouring man. The sailors are principally composed of boys from the sea-side. The knowledge which they can acquire of their craft must be slight. The mast at which they practise is only very partially rigged; and I observed their instructor, an old sailor, setting a most unblushing example of going coolly through the "lubber's hole" into the top, followed by his band of embryo mariners. These children are mainly employed in making and mending the hammocks of the community.

The discipline of Mettray, it will have been seen, is strict; and every fault is firmly, but not cruelly, punished. The scale of penalties is as follows:—1st, and mildest. Exclusion from the list of honour; 2nd. Stoppage play hours; 3rd. Extra labour; 4th. Bread and water; 5th. Solitary confinement in a light cell; 6th. Ditto in a dark cell; 7th. Expulsion, and remission to the Penitentiary. No boy is ever punished on the spur of the moment. When a grave fault is committed the offender is sent to the "Hall of Reflection," where he has time to think his conduct over. The director in the meantime hears evidence upon the matter, and considers it in all its bearings, allotting the punishment after mature deliberation. Imprisonment is found to be by far the most efficacious. When an offender is shut up he is frequently visited and reasoned with by the chaplain and the director, and the common result is well expressed in the *naïve* confession of one of the boys, that he would rather be flogged, but that he knew the cell did him more good.

Inscription upon the list of honour is earned, as I have said, by the fact of a *détenu* having passed three months without punishment. The condition of discipline of the establishment may be inferred from the state of the list of honour at the commencement of the present year; premising that, as the average period of detention at Mettray is three years, the numbers upon the list must fall off after the 12th changing of the list. The number of children in the institution was 546. Of these there stood upon the list of honour for the first time 36, for the second 29, for the third 18, for the fourth 22, for the fifth 19, for the sixth 16, for the seventh 12, for the eighth 10, for the ninth 9, for the tenth 8, for the eleventh 5, for the twelfth 4, for the thirteenth 4, for the fourteenth 5, for the fifteenth 1, for the sixteenth 1, for the seventeenth 1, for the eighteenth 1, for the nineteeth 1, for the twentieth 1, for the twenty-first 1.—Total 224.

Mettray is remarkably healthy. During the last year the number of deaths were 4, being at the rate of 1 in 134. The statistics of the infirmary also show that the risk of death is considerably greater during the first than during the subsequent years of the *détenu's* sojourn; thus proving the increase in health and power of vitality gained in the establishment. In the Penitentiary of Tours, last year, two-thirds of the entire number of inmates were swept off in three days by cholera. On the high ground about Mettray the pestilence also raged with great severity. In one house every member of the family was struck down. Within the institution not a single case occurred; and a similar exemption was enjoyed after the cholera, when dysentery took its place and spread with almost equal fatality. I may add here that the *détenus* placed in service in the neighbourhood are, when ill, again received into the infirmary, and treated as though still inmates of the institution. Of the four deaths last year, one resulted from pulmonary consumption, one from brain-fever, one from typhus, the last from scrofula.

I now proceed to give some interesting details as to the practical effect produced by the institution of Mettray. Up to the 1st of January, 1850, the total number of children received was 1,184. Of these 144 arrived during the year 1849, and 546 was the number actually in the institution last New Year's Day. Of the 1,184 *détenus*—

717 arrived in a state of total ignorance.

270 had an idea of reading.
143 could read.
54 only could write.

The greater part of these children have already left the institution able to read, write, and cypher. Fourteen hours a week are in all devoted to the work of instruction. Of these, two are given to religious teaching, two to vocal music, taught after Wilhelm's method, and the remaining ten to reading, writing, and arithmetic.

Since the foundation of the colony, up to the 1st of January, 1850,

528 boys had left Mettray.

Of these, 378 have gone back to their families, or been placed with masters. Of the others—

150 have entered the military or naval service; some in consequence of the conscription, others voluntarily, a few as substitutes.

Of these last, 127 are in the army, 23 in the navy.

Of the whole number, 17 are married, and for the most part fathers of families.

So far as conduct goes, the following is the general result:—

Of the whole 528—

450 are leading irreproachable lives.
26 are conducting themselves tolerably.
6 have escaped the surveillance of the society, and
46 have relapsed into vicious courses.

Of these 46, it is stated that 33 are children from great cities, 19 being from Paris; the remaining 11 belong to the country. In estimating the proportion of the children who have fallen back into criminal practices, the directors justly call upon the French public to remember the miserable origin and depraved connections of these poor boys. The *détenus* from the department of the Seine can very seldom, and with very great difficulty, be restrained from crowding into Paris. The proportion of 6 per cent. of Mettray backsliders is contrasted by the directors in their last report with the 25 per cent. of relapses into crime, stated to characterise the *détenus* dismissed after a career of industrial discipline from the Wurtemberg House of Correction.

I have said that great pains are taken to preserve unbroken the moral ties binding old Mettray pupils to their former home. Since the institution of the colony no less than 4,000 letters have been received from such persons, and fully and cordially answered; and I understand that it is common with the boys, as they get on in life and establish shops, to take for signs the motto, "*Au Colon de Mettray*," The *quondam* colonists settled near Mettray frequently pass all their Sundays in the institution, hearing the service and taking part in the music, as of old. Some of them regularly bring their wives. The letters from old colonists at a distance are always read to the family to which the writer belonged; and having been indited with this view, are frequently full of very touching and *naive* advice. I have specimens of such before me, as well as details of a number of interesting and characteristic traits of conduct exhibited by the Mettray pupils. I select one of the latter.

M. l'Abbé Fissiaux, the director of the subsidiary colony at Marseilles, when visiting Mettray, asked the assembled children to point him out the three best boys in the institution. There was no difficulty about choosing, and the three were elected unanimously. "And now," said the Abbé, "that I know the three best boys, I wish to know the worst." There was a long silence, until at length an urchin, moving timidly out of the rank, said "I am." The Abbé, with fine tact, replied that the self-denunciation showed the boy to be mistaken, and that he could not take his word upon the point. It is added that since the scene in question the boy has behaved excellently well.

The financial details of Mettray prove that although as yet it is not, it has still a fair chance of becoming a self-supporting institution. In 1847 the deficiency required to be made good by subscription was only 30,000 francs. The events of 1848—the stoppage of work in prison particularly—inflicted a severe blow upon Mettray. The Government at the same time reduced the allowance given per child per day from 80 to 70 centimes, while the 80 francs allowed for the purchase of the clothes of each child was also lowered to 70. Things are now, however, I believe, placed in all respects upon their former footing; and the authorities are confident that, by enlarging the sphere and improving the manner of their agricultural operations—both of which tasks have been vigorously undertaken—the colony will in a few years rest upon as sound a financial as a moral basis. It only remains for me to add my own impressions as to the appearance and conditions of the children. I arrived at Mettray when the first half of the dinner hour was just over, and when from every household the children were marching out to spend the remaining portion of the hour in play. The regular tramp of so many hundred sabots down the stairs and upon the gravel showed the military precision with which the evolution was accomplished. There was perfect silence in other respects until each family defiled in orderly procession from its house; then at a signal from the chief, the ranks were broken with a shout, and the boys rushed gambolling and singing to the playground. There jumping, leap-frog and blind man's buff became the order of the day. Spring boards had been prepared for leaping, and were speedily put in active requisition. I was soon satisfied as to the high health and bodily powers of the children. Better running and longer and higher leaping I never saw. Most of the competitors stripped off their coarse gray blouses, kicked aside their clumsy sabots, and buckled to the sport in trowsers and shirts. There was of course plenty of noise, but no rudeness, and little coarseness of demeanour was visible. High spirits, rude health, and intense enjoyment of the limited time allowed for recreation, were never more palpably or more agreeably shown.

But the pleasant half hour flitted fast away. The inevitable bell tolled from the seminary of the *contre maîtres*, and the peal was answered by a loud flourish of trumpets from the musicians of the band. Instantly—as promptly, indeed, as soldiers in the most perfect state of discipline—a long double line was formed down [one side of the square, each household like a company drawn up together. The officers of the institution marched up and down the ranks, inspecting dress and carriage, and then at the word of command each company faced in the direction of its *atelier*. The cornets, six in number, burst into a merry quick step —there are no slow marches in Mettray discipline —and in a couple of minutes the yard was clear, the busy sounds of hammers, saws, and flails were echoing from barns and workshops, and the *chefs de famille*, who had lingered for a moment, like a group of staff-officers, upon the ground, were proceeding to their bureaux—the children in their working hours being under the direction of *chefs d' atelier*—to perform that important part of their duty comprehended in drawing up the regular reports and keeping up with the tide of correspondence.

Such is Mettray. I only add, that my account is compiled from what I saw and heard on the spot, and from the official documents placed before me.

To return, for a few concluding paragraphs, to the subject of the small properties around Tours. Indian corn begins to be cultivated between Blois and Tours, but only in insignificant patches. The plant, however, flourishes bravely, making a goodly show with its tall, graceful stalks, and pennant-like leaves streaming out from among the vines. The maize raised hereabouts is used exclusively to feed poultry, particularly turkeys, great flocks of which may be seen in the fields in the more open parts of the country, under the charge of a boy armed with a long rod and a piece of red rag flickering at the end. As in England, the turkey forms a great Christmas dish; the goose hereabouts, having a bad character on the score of indigestibility, is only to be seen at the tables of those who cannot afford better. All round Tours, and indeed in the vicinity of all the Loire towns, landed property is split up into what would appear to us ludicrously small sections. Going out to Mettray, I was informed that a small field by the roadside, a spot about a third of the size of Westminster Hall, belonged to seven proprietors. Fortunately, they were all of the same opinion as to the cultivation of their landed property. The field had borne two crops of clover, and they had divided the profits of the produce. This extreme subdivision of property I find almost invariably to subsist in the vicinity of towns. There land is of greater value, because devoted to the production of market garden stuffs, which always command a speedy market and a good sale. There, too, manure is cheap and easily conveyed, while the number of handicraftsmen or small traders who manage to lay by savings, and who almost invariably invest them in land, tends, of course, to the sure and rapid production of the state of things in question. Indeed, it is only in such situations as I have already hinted, that physical causes will permit a subdivision of property at once general and minute. There a proprietor is not necessarily a cultivator, or, at all events, he is only in part a cultivator. A man buys, with money saved at the shoemaker's lapstone or the carpenter's bench, a patch of land. He makes an arrangement, for a certain yearly sum, with a labourer—who generally sleeps at his house, but boards himself—to do all the necessary out-door work. In the wages of this latter functionary a cow's grass is frequently included. In some sort, therefore, the cultivator is the tenant of the proprietor, causing the earth to produce its fruits, keeping a certain proportion of their value as the price of his services, and handing over the remainder—in other words, the rent—to the landlord. It frequently happens that a man is the tenant, in the sense in question, of several landlords, at the same time also that he is himself the proprietor of a patch of land. The difference, I am told, in such cases, between the condition of the labourer's own estate and those of his neighbours committed to his charge is a notorious subject for merriment. "Always," said a peasant to me, "always buy grapes, if you can, from the man who has raised them on his own ground." I may add here that it was my lot, a few days ago, in a small town, of which I purposely omit the name, to fall in with an honest little Irishman, naturalized in France, and driving a small, but apparently decidedly flourishing, grocery business. No one, to look at his bronzed features, bloused figure, and smart *casquette*, would have dreamed that he was other than a native of the soil; and when he addressed me in English, I tried instinctively to recognize the Gallic accent which no Frenchman whom I ever heard speak our language has succeeded altogether in dropping. I was at fault, however. Accent there was none; and, seeing my look of curiosity, my interlocutor made haste to add that he was born in the good town of Armagh, but that he had been naturalized here, and was settled very snugly with a French wife, and a thriving grocery shop, whither he speedily conducted me. A long chat ensued. I asked how he had weathered the revolution. "Oh, famously. No one meddled with me. It was only in the towns where a great number of English were settled, and were obviously and manifestly keeping the like number of natives out of work, that the temporary madness of the people prevailed against them." Of the English in Rouen and Elbeuf he had some knowledge, and he spoke in the highest terms of the continued and energetic, although vain, efforts of the French magistracy to curb the passions of the mob, and to afford every protection in their power to the English, whom they supplied with money, food, and the means of conveyance. Many of the expelled workmen were now, however, one by one returning; and the colony of our countrymen in Elbeuf, at all events, would soon, he thought, be as extensive as it was before. The Irish-Frenchman spoke with warm praise of the habits of forethought and saving of a great proportion of the poorer people by whom he was surrounded. Carrying on a considerable retail traffic in articles of ordinary necessity, his testimony in this respect struck me as being valuable. There were some English, of the better class, from time to time established in the town in question, and the grocer declared that he had often lost money by them, but seldom or never by his poorer French customers. "The working people hereabouts," he said, "are seldom or never, let times be as bad as they may, without a score or two of francs, more or less, to come and go upon. They are very ready, too, to help each other at a pinch, and except to notorious characters I never have any difficulty in giving credit. I know that when they get the money I shall get it. Besides," he added—and it is for his opinion upon this point that I have mainly introduced the circumstance of our meeting—"the small-property system is a great help to them. There are very few folks hereabout who have not got little patches of freeholds. If one member of a family has not, the other has. The money they get out of them is no fortune to be sure, but it always helps, and it is a great matter for a working man to have something, however small, over and above his daily toil, to fall back upon."

But the great advantage of the small property system, in the opinion of this (whether his views were right or wrong) very intelligent and industrious man, was to be found in the facilities which it afforded for the investment of small sums, and in the improved moral tone which the possession of real tangible property gave to the lower classes. "It's very easy," he went on to say, "to invest a good lump of money in England, but it is not so easy to invest a small one. The poor man who has saved £20 or £50 hardly knows what to do with it. There's your savings banks, to be sure—and a nice mess you seem to be making with them—look at my own country; but savings banks give no such inducement to a man to save as land does. When you've got your own little estate, your money is safe. The land can't run away nor lose its value. You may build your house upon it; most folks hereabouts do; and there you are rent-free, and comfortable, with your trade, for the rest of your days. Oh, there's an independence in this state of things that the poor of England can never know. And then it makes a man somebody, when he can walk on his own ground, and think of his latter days without thinking of the workhouse as well. Besides, the vision of the vineyard or the corn field is before all eyes here. Any industrious sober man in France may become a landowner; there's nothing very difficult about it now, and it's that feeling that encourages the people to strive for it. There's many a neighbour of mine, working hard and living hard, and laying up his savings to buy land, who would be spending them in England; and that, just because it seems a common and a practicable thing for men in his class to get land here, whereas it's a very uncommon and almost impracticable thing in England."

I said that our practice was beginning to alter in that respect, and I mentioned the societies and companies of working men formed to procure forty-shilling freeholds. But my Anglo-Gallic acquaintance would not allow that any difference was thereby made in the argument. "If it takes societies and companies, and machinery of that kind to put working men in possession of land, the thing won't do. To work for good, the system must be a part of the very daily lives and thoughts of the people. Working men don't require societies or companies to buy their dinners or their coats—why should they to buy their land? Here the soil is constantly being bought and sold, and there is no long lawyers' work of conveyances in the matter. The thing is done as fast as you could make a bargain for a horse or a cow, and you can then either set to work with a hoe or a spade, or the cast of a plough, if you have a turn that way yourself, or you can hire somebody else to do the farming, and the produce will always be something coming pleasantly in on the top of the week's wages. The argument that small patches of land, cultivated by comparatively ignorant men, with such cheap and rude tools as they can afford to buy and know how to use—the argument that such land must, in the nature of things, be ill-cultivated, and that none of the discoveries of agricultural chemistry can possibly be applied to it—my acquaintance met, by insisting upon the great amount of manual labour, and the constant pains-taking care bestowed upon the soil, which he believed to be of as much agricultural value, and in the end to produce as good crops as could be reared by the largest and most scientific farmers; while, as to a great proportion of this labour being mere waste of human energy, seeing that the same results could be obtained upon a larger scale, with a tithe of the number of hands now employed, I was challenged to point out, as existing in France or in any other country, any species of labour upon which the mass of the rural and small town populations could be more beneficially employed.

I have thought the outlines of this conversation worth giving, inasmuch as the records of the opinions of persons practically conversant with the working and the results of the small-property system, are always of more or less value as forming materials for ultimate judgment. Of one thing, however, I am becoming more and more convinced, that it is quite possible, by selecting districts placed under different physical circumstances, but obeying to a greater or a less extent the general laws which influence the distribution of landed property in France, to get up masses of evidence, all of which shall be, in all their bearings, strictly and literally correct, and which shall yet be thoroughly self-contradictory—one-half of the results coming out as much in favour of, as the other would against, the policy and working of the system in question.

The great fallacy, as it strikes me, of the arguers for the infinitesimal distribution of property, is their plea that property will not be further subdivided than it is for the interest of the proprietors that it should be; whereas, the practical result is, that the very existence of the system, to a great extent, forces on its operation, without anything like due regard for unfavourable local circumstances—slight and temporary but immediate advantages being naturally too often mistaken for ultimate and permanent benefits.

During the course of my rambles in Touraine, I made inquiries as to whether the threshing-machine was ever used upon the larger farms. There were, I was informed, but two or three in the whole district. An attempt had been made, a few years ago, to render the introduction of the machinery general; but the labourers, as well as many of the small proprietors themselves, made stout and successful head against the innovation. The flail is the principal winter resource of the French peasant, and a species of modern Jacquerie was threatened if the intruding implements were not given up. In fact, a similar temper was evoked to that which, twenty years ago, used to light the skies over rural England with bonfires made of farm machinery, and the feeble and vacillating spirit of enterprise and improvement drooped and died before it. Another circumstance which aided the peasantry in their successful crusade against the threshing mill, was the fact that it was found necessary, upon its introduction, to erect new buildings for its reception. In the few cases in which the machinery was set up in the old bar m the whirl and shake of the revolving mechanis speedily brought the rickety masses of ill-piled masonary, and crazy and crumbling wood, down about the ears of the proprietors. Thus the flail still lords it even in the finest corn districts in France.

COPROLITES, OR FOSSIL MANURE.

Sir,—From the many inquiries I have recently had respecting the "diggings" at Barnwell, particularly since the paragraph which appeared in your paper about three weeks since, and the repeated specimens I have received, from various localities, of the nodules, for information of "what they were," I am induced to trouble you with a few observations on these remarkable fossil productions of our strata, in doing which I will correct an important error of the press, made in the paragraph alluded to, which might tend to mislead many respecting their actual value. It was there stated that the nodules now being raised at Barnwell fetched £30 per ton; 30s. per ton would be nearer the mark, including washing and labour. The extraordinary deposit of these curious substances, whether from the abundance in which they are found, or that they should at this remote period contain almost all their original organic matter, considering the countless ages they have remained buried, must be a matter of astonishment to all reflecting minds; but now that they are getting a considerable article of commerce, it is a matter of interest to those who possess them on their lands, and to whom they now possibly pass unheeded as common debris or gravel, fit only for road-mending. I have no doubt that wherever there is an out-cropping of the upper green sand, the strata in which they are found—and it extends to a considerable distance around Cambridge—that there these peculiar nodules may be met with; and this, the surface bottom of an ancient deep sea, appears to have been the receptacle of the bones and fæcal matter of its inhabitants for a long period; which matter is now, by the penetrating researches of the geologist and chemist, brought to light as containing the fertilizing principle and pabulum of vegetable life; verifying the great axiom of chemistry, that nothing is lost in organic atoms, and that the refuse of former ages in an indirect manner produces the gold of the present. The parish of Barnwell contains an extensive deposit of these coprolites, or fossil dung. In a field near the railroad bridge the upper green sand appears on the top of the gault, varying from eighteen inches to six feet below the surface, and from six to twenty inches in thickness; overlaying this is a mortar, looking conglomerate, resulting from the debris of denuded chalk, from which these substances are in considerable quantities being raised; where the depth from the surface is greatest, there the deposit also appears to be the greatest. For years the article now so much sought after has been the bane of the brickmaker, and *tons* have been thrown into old excavations to get them out of the way as useless rubbish, while from £60 to £80 have now been given for liberty to dig over a two-acre field. From the railroad to the opposite side of the river they may be traced, and to a considerable extent on both sides of the river to Horningsea, where I understand diggings are going on. From Denny Abbey, across the county to Cottenham common, the green sand crops out; and although it varies in geological position, it may be well for those interested to examine if it does not contain the coprolites; on the west side of this town they are to be met with in considerable quantities, lying upon the surface; the fields on each side, from the Barton road to Granchester, abound with them, and they are probably to be met with between this point and the escarpment of chalk at Orwell, but which beyond the turnpike I have not investigated. On examining a field of potatoes in the parish of Wimpole, to trace the disease, I was struck with astonishment at the extraordinary quantity abounding on the surface there; beyond this, the diluvial patch of clay that covers the chalk cuts off all geographical probability of finding them. The appearance of these nodules is in shape various; generally a hard, black, water-worn looking stone, with excrescences; some with convoluted marks, bearing the impress of the intestine, and rounded off at the extremities, the surface of all exhibiting lines from the decomposition of some of its more destructible parts; portions of corals, ammonites, crustacea, sponges, &c., may be found in the agglutinated mass; they vary in size from a small bird's egg to masses the size of a fist. A large selection from our own, as well as from distant localities—the lias of Lyme, the chalk of Farnham, the shale of Newhaven, and crag of Suffolk—I have open for the inspection of those interested. The process which they go through to render them available for use may not be out of place. After being selected from the soil, they are well washed by rotatory machinery erected on the spot, and then conveyed by rail to the manufactory, where they are ground to a fine powder (an operation of no small difficulty, from their hardness—vertical granite or buhr stones being required); the powder is mixed with about an equal proportion by weight of strong sulphuric acid, by the action of which it is reduced to the state of a super-phosphate, and is thus sold under the name of coprolite and acid. This is, I believe, part of the process used in the manufactory of Mr. Lawes, who produces a very superior article, and to whom we are much indebted for his early attention to supply the increasing demand for phosphates as artificial manure, and who has been supplied with thousands of tons from digging over a four-acre field at Walton, in Suffolk, the subsoil of which was crag, producing to the farmer a much richer harvest than grain at the present free-trade prices. In an article varying as it must necessarily do from extraneous matter, the component parts materially differ. The following analysis may be taken as an *average* of their composition: 100 parts containing—

Earthy phosphates	61
Carbonate lime and iron	24
Insoluble	12
Moisture	3
	100

Mr. Lawes, from a sample from the same locality, made seven parts more phosphates, and Mr. Potter four less, than the above analysis of my own.

There is a prevalent idea that these coprolites are almost the same as guano. This is a great mistake; for although our own production yields a larger proportion of the phosphates, it is devoid of salts of urea and ammonia, which, in combination with the phosphates, increases to a considerable extent the fertilizing principle for which that foreign article is so celebrated. It has been the object of artificial manures to supply synthetically the composition of guano at a much reduced rate. In respect to the value of coprolites in our locality, besides giving employment at this season to many idle hands, a bonus has been given for the right of royalty over the soil, and 5s. per ton is paid the proprietor for all raised; this, with labour, washing (a troublesome and tedious process), and rail charges for delivering in London, cost from 35s. to £2 per ton. To show the comparative value of the different substances containing the phosphates and that of guano, an analysis of a good sample of guano is here given, and that of the phosphates and carbonate of lime in various bones. That portion contained in the fossil remains of bone and coprolite is a beautiful illustration of the goodness of the Great Author of nature; remains which, after being interred during thousands of years, are, by the labours of man brought again into action, that their elementary parts may be again separated and made subservient to his uses.

Hoping that these remarks may be sufficiently explicit to those who are interested and seeking information on the subject, I am, Sir, your obedient servant,

King's Parade, Feb. 20, 1851. I. Deck.

Analysis of Guano from Peru.

Urate and salts of ammonia	34.05
Various phosphates	37.04
Carbonate of lime	1.65
Soda and potash	8.92
Silex	4.28
Water and indefinite organic matter	14.06
	100.00

Comparative Analysis of Bones.

	Phosphates.	Carbonate of lime.
Recent human bones	81.09	10.03
Ancient ditto, from a Roman tumulus	76.38	10.13
Fossil bone from the crag	60.02	18
Recent ox bones	57.35	3.85
Sheep	80	19.03
Hen	88.09	10.01
Frog	95·02	2.04
Fish	91.09	5.03

ON THE CULTIVATION OF WASTE LANDS.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

Sir,—I have just read an article in your last magazine headed as above, and signed "John Ashford." With every respect towards Mr. Ashford, and admiration of his classical attainments, he must allow me to say that his suggestions will be likely to pass unnoticed, or at least unacted on, while present prices continue. Before a man will undertake the cultivation of a portion of waste land, he must feel reasonably assured that doing so will pay him; that the value of the produce will be worth something more than the expense incurred. To expect a profitable return for any such outlay is now chimerical. So far from waste lands being brought into cultivation, much land that has hitherto been cultivated will be added to the waste.

The duty of our government is to encourage the cultivation of every inch of British soil, even to the hill tops: but instead of this—instead of making it the self-interest of a man to cultivate his land well, the government make it his interest to abandon cultivation altogether; and the consequences may be truly awful. Farmers finding that good farming will not pay, are sure that bad will not, and are therefore resolved to give it up altogether.

Many thousands of acres in the west of England will be thrown up within twelve months as profitless. I know some parishes, where one to two thousand acres in each will be thus abandoned, the present occupiers intending to emigrate. This I assure you, is a specimen of a system of retrogression and desertion which will soon be general, and which may involve this country in all the horrors of famine.

Yours obediently,
A Land Agent.

Devon, Feb. 20*th*.

ON THE PROGRESS OF AGRICULTURAL KNOWLEDGE DURING THE LAST EIGHT YEARS.

BY PH. PUSEY, M.P.

(From the Journal of the Royal Agricultural Society.)

(Concluded.)

THE IMPROVEMENT OF LAND.—(*Continued.*)

§ 9. *Irrigation.*

The formation and use of catch-meadows have been lately described in this Journal.* They cost about £3 an acre to form, while farmers say that they double the produce; and their formation may, therefore, reasonably be set down as yielding a profit of from 30 to 50 per cent. No other agricultural investment can be compared with them for profit and convenience. They belong specially to the western or rainy sides of Great Britain and of Ireland, where the mild winters favour the growth of grass, and they are at home on the mountain sides which rise on those coasts. But though born on the glen-side they have spread over the flats, and I have found them invaluable on the dry side of England for summer use also during long drought. Sometimes, too, gutters may be cut very cheaply, say for £1 an acre, to distribute the occasional floods of rivers—an improvement which may be equal to a dressing of dung. Summer irrigation has a tendency in some places to rot sheep, but it has not done so yet here, and the water is laid during summer on the Duke of Portland's famous meadows at Clipstone. I have obtained from a friend for the present Journal an account of the water-meadows in Switzerland. There, as here, the growth of watercresses and excellence of the fish are the proofs of water fit for this purpose. But they have a third proof—the power of dissolving soap. This sets at rest the question whether water *must* be hard for irrigation; since every washerwoman knows that hard water contains lime, and curdles her soap. The peculiar softness of feel as a test of good water leads me to believe in a new cause of its mysterious action, not exclusive of the old causes, but additional to them, for *winter* irrigation is a *complex* phenomenon. In speaking of ammonia brought from the air by rain, Liebig says,†

> "The sensation produced upon moistening the hand with rain-water, so different from that produced by pure distilled water, and to which the term *softness* is vulgarly applied, is also due to the carbonate of ammonia contained in the former."

He further tells us that Hünefeld has proved all the springs in Greifswalde and three other places to contain carbonate and nitrate of ammonia. It appears to me a legitimate inference that our own soft and warm springs, issuing from the depths of the earth, fertilize our meadows by bringing with them ammonia, the result perhaps partly of ancient volcanic action, partly acquired by filtration through the upper soil; for in soil, too, even uncultivated soil, modern chemistry has recently detected ammonia, so that this hidden spirit of vegetable life not only hovers over us in the air, but also broods in the earth, and gushes forth with the fountain. My own meadows are managed in a new manner by repeated pennings with sheep, and on a farm of about 460 acres I keep a thousand breeding ewes, some of which are now fatter than necessary, being almost fit for the butcher. Nothing in fact pays better than growing grass, or worse than sour pasture.

§ 10. *Breaking up Grass-land.*

Although the present price of corn, therefore, is not encouraging, occupiers still look on it as a boon to be allowed to break poor grass land. No doubt, if worked in a four-field course, it will keep as much stock in the two years of green crop as it before would in four; so that you get the corn for the cultivation, which on some such land may be very light. Take a light moory land, for instance, which here, at least, cannot be ploughed too little. Pare it with the breast-plough, burn, sow rape-seed, and pare again to cover the seed. This may cost 28s.; for which, if the ground be cool, you may get a crop of rape that will hide the sheep as they eat it. Next year pare again with the breast-plough, which may this time cost 8s., and sow oats, with rye-grass, that may remain for two years. Two hundred acres of such land were cultivated in Gloucestershire in this way by a family of good farmers for a long course of years, without feeling the plough more than once in four years. The crops are good, and the whole expense of such cultivation is insignificant. But there are so many kinds of poor grass-land to be broken up, that it would be unwise to lay down fixed rules for doing it. Certainly, however, where the land is pretty fair, you may take some liberties with it at the beginning, and grow two white crops together; but it is thought best generally to begin with a green crop for fear of the wireworm.

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* On Catch-Meadows. Journal, x., 462.

† Liebig's Agricultural Chemistry, 4th edition, p. 46.

§ 11. *Improvement of Farm-buildings.*

There is no doubt that our farm-buildings are grossly deficient in many counties, and it is unluckily equally certain that to build them anew exceeds the means of most landlords; but to build cattle-sheds for those which exist, or set up a new field-barn and yard at the farther end of a farm, may often be done very cheaply, by help of a stone quarry and plantations on the estate. The farm-house, too, should be made a comfortable residence. A farmer with a family is not merely a farmer, and a superior farm-house is good for his landlord as well as himself. The farmer's habits and situation are so much raised that the farm-house may well resemble the parsonage. But besides the difficulty of finding money to raise an entirely new farmstead, a man with £3,000 set apart for the purpose might well be uncertain what plan to adopt. Notwithstanding the really excellent plans of farm-buildings we have recently published, for one I certainly should be puzzled; because farm-steadings, like certain countries, are really in a state of revolution. Our old ideas about them are unsettled, our new ones undetermined. Their form must depend on the management of stock, and the management of stock partly on the management of manure, which last is become the most intricate of all points in husbandry. Manure, however, belongs to the practice of farming. We may here close, then, the list of improvements which it is in the landlord's power to effect. We must add, indeed—

§ 12. *Warping*

But though an admirable operation, still, as it is confined to two rivers, the Ouse and the Trent, it is not of general practical interest, and having been often described in this Journal, will not require our attention. Landlords' improvements stand then under the following heads:—

1. Draining ....
   1. Trunk draining.
   2. Under draining.
2. Removing ....
   1. Fences.
   2. Trees.
3. Game.
4. Burning clay ......
   1. Border-burning.
   2. Clod-burning.
5. Claying ....
   1. Sands.
   2. Peat.
6. Liming grass-land.
7. Boning grass-land.
8. Chalking.
9. Catch-meadows ....
   1. Hill-side.
   2. Flat.
   3. Flood.
10. Breaking up pasture.
11. Farm buildings.
12. Warping.

Our means of improvement are certainly manifold. I have been anxious to prove them so in these times of difficulty, because in agriculture, as in medicine, there is a tendency to dwell exclusively on some particular remedy. The quack, indeed, has of course only one nostrum; but even regular physicians have a leaning sometimes to favourite drugs. Variety of treatment, however, is the true test of ripe art. They are not arrayed as if English landlords were slow in adopting admitted improvements upon their properties, for such is certainly not the case now; but landlords do require that the variety of their resources be brought under their eye: they will find in almost all these practices the additional merit, which I know by experience to be great, that while they improve the land they relieve the tenant from the necessity of finding employment for labourers in the winter—a time when farmers can often hardly find work to give.

Management of Manure.

The construction of farm-buildings, as I have already said, must depend on the proposed management of the manure. But this is a doubtful question, even in practical farming; and chemistry can as yet say little about it, because we have few analyses of the droppings or urine as they proceed from the animal; and if we seek to trace the changes which these afterwards undergo, we find, unfortunately, that Boussingault's analyses of prepared dung, on which we might have hoped to reason, are pronounced by Liebig* to be chemically incorrect. Walking then thus in the dark, it behoves us to be wary in following lights that would divert us from the beaten track. Our practice hitherto has been to make the dung in open farmyards; but to this practice two objections are raised,—the escape of ammonia into the air, and of liquor into the neighbouring ditch. For these two defects then various remedies have been proposed, one of them the use of liquid manure. Sometimes a drain is made from the cow-house, conveying the urine into a tank; from which it is carted, and so distributed over the land. One farmer I see thus distributed the urine of thirty beasts, unmixed, in the last spring, having kept throughout the winter. I feel bound to point out the heavy loss he has thus incurred. According to Sprengel the contents of a cow's urine stand as follows:—

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* Liebig's Agricult. Chemistry, 3rd edit. p. 209.

Water	92,624
Urea	4,000
Free ammonia	205
Other matters	3,171
	100,000

The urea is the matter from which is formed by fermentation the ammonia which we seek to detain; and Sprengel, desiring to ascertain how far water would serve the purpose, left one portion of the same urine pure and another portion mixed with an equal quantity of water, both to stand for a month. The result was as follows:—

Pure Urine.

Water	95,442
Urea	1,000
Ammonia, partly uncombined	487
Other matters	3,071
	100,000

Mixed Urine, omitting the water added.

Water	93,481
Urea	600
Ammonia	1,622
Other matters	4,297
	100,000

"The addition of water," Sprengel remarks, "has this advantage, that the diluted liquid contains nearly four times" (more than three times) "as much ammonia as urine left to putrefy in its natural state, though it retained only 0·4 less of urea." * He supposes that a cow produces 15,000 lbs. of urine yearly, and that by leaving pure urine in a tank we should thus lose 162 lbs. of ammonia, which, at Mr. Way's estimate of 6d. per lb., would be a yearly loss of four pounds sterling per cow; and this, too, as compared with the mixed urine.

The loss of ammonia on the mixed urine is severe, amounting in fact to one-fifth. Well may Sprengel say, "Whoever is obliged for want of straw to collect the urine separately, whoever, if compelled to do this, mixes no water with it, or fails also to employ some neutralizing substance to combine with the ammonia, suffers a loss of manure which exceeds all belief." I can nowhere find how much water is necessary to save all the ammonia. If much, the labour of application is greatly increased; but however much water be used, when we consider how slightly even a heavy shower of rain penetrates dry ground, I cannot but think that much of the ammonia after it has been delivered from the cart must be liable to escape. Besides, if the urine be collected separately upon system, what is to be done with the straw? It cannot be used separately as dry manure. Are we to cut it all up into chaff as food for stock? I do this largely myself; but it may be done, I think, too largely. There is reason to think, as we have seen, that the good effect of straw in supplying carbon as the substance of crops has been too much overlooked lately. Now it is clear that a large part of the straw eaten by stock is literally *consumed* by them, and is dissipated like smoke through their nostrils in their breath. According to Black, a sheep fed on 100 lbs. of rye-straw with water voids only 40 lbs. of excrements *solid and fluid*, so that more than half the carbon is wasted. The same thing, in fact, happens as in the obsolete Lincolnshire practice of threshing the wheat and burning the straw afterwards in the fields. If our stock eat the straw from 100 acres, we have in fact burnt the produce of 60 acres. It is an excellent practice to give chaff as food; yet if all the manure be applied as proposed in a liquid form, we might burn too much straw. But there is another of the three great manuring substances, namely, phosphorus, about which we have to enquire in judging the propriety of employing liquid manure; and when one sees it stated broadly that modern science has decided in favour of liquid manure—when one reads, too, that in a Scotch county iron pipes are laid down over a farm of nearly 400 acres, at a cost of towards £2 per acre, in order to distribute the urine of 150 cattle by hose over the entire surface,—however much one must respect enterprise and ingenuity, it becomes imperative to examine the philosophy of the arrangement. Now, it actually appears by the analyses of Boussingault and of Von Bibra,* that the urine of the ox or the horse contains none of the phosphorus voided by them, which remains exclusively in their solid droppings. The arrangement, then, really seems opposed to theory as well as to practice, since an expensive and troublesome apparatus is laid down, which not only leaves behind carbon, about which some doubt may exist, but actually forgets another element—phosphorus, known positively to be essential for a principal crop, that of turnips. It may be possible to amend the plan by mixing the solid droppings with the urine, and force both united through those pipes. It may be possible, I say, to force this pulpy fluid through a long range of pipes without clogging them, though I much doubt it. But even then, I ask, what is to become of the straw? Are we prepared to forego all use of it upon the land; and if not, in what form is it to be applied? When the capital of landlords is so much wanted for undoubted improvements, it becomes a bounden though ungracious task to warn them against what appears to the last degree questionable in science as well as novel in practice. We indeed have little or no experience on the subject; but foreign writers, who are best acquainted with liquid manure, seem least enamoured with it. We have heard Sprengel, a German and a chemist, who says again, speaking of its German use as mixed largely with water, "The urine tanks are not such excellent arrangements as they are frequently represented to be, and it is in many cases more profitable to pour the urine over the dung in the dung-pit, or to supply so much straw that the whole of the urine may be absorbed." What says our other great authority, Boussingault, a French chemist and farmer? "He is led to adopt the opinion of Mr. Creed respecting them, viz., that the advantages ascribed to them in Switzerland are exaggerated." Lord Spencer, I know, had strong objections to the housing of cattle, except of course the fatting beasts. When he first began farming, as he told me, it was the fashion for every gentleman who piqued himself on his farming to soil his cattle; but he had seen the fashion expire. Sir John Sinclair visited a field of a Mr. Harley's, manured by an engine with cow-house drainage, which had been mown sixteen times in three years." This statement is, I suppose, forty years old, yet one would think it had been written yesterday.

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* Sprengel on Animal Manures. See translation, Journal i. 455.

* Liebig's Agricultural Chemistry, 4th edit. p. 269.

This marvellous effect of liquid manure is not indeed due simply to the use of the liquid. The mere mowing would give more grass, because the feet of animals trampling at liberty, while they feed at will, checks the growth of the young grass; and this I believe to be the principal reason why folding of sheep, as already mentioned, should afford so much more keep than allowing them to range at large. The system seems specially suited for cows kept to supply large towns with milk; but even if the use of liquid manure were desirable as a general practice, it seems scarcely suited to the health of young animals. Foreign writers always ascribe its adoption to scarcity of litter. In Switzerland, where it has been longest in use, the straw litter of the cattle is twice a-week withdrawn from their beds, washed, and replaced; but such a scarcity of straw is certainly not the grievance under which our arable farmers labour.

It has also been proposed, as a remedy against the escape of liquor, to roof over the farmyard. But the straw lying loose would be apt, I think, to get fire-fanged, as is now the case with horse litter thrown too thickly into the yard during dry weather. In this part of England the dung does not get made even in the open yard when our usual scanty allowance of rain at all fails. A roof for the dung-heap has been further also suggested. This may, perhaps, be required in Lancashire, but I would not venture it here.

Seeing, then, the lack of a remedy, it may be worth while to enquire into the extent of the disorder; and, first, as to the escape of ammonia. The two remedies which Boussingault, *as a chemist*, proposes, are the exclusion of air and moisture. "The daily addition of fresh litter from the stables," he says—speaking indeed of the dunghill, but the principle applies equally to the yard—"powerfully impedes the escape of any volatile elements, protecting the inferior layers from the direct contact of air." The German Thaër, indeed, examined chemically the air collected from the surface of dung-heaps, and found little or no escape either of carbon or of ammonia. Pressure our farmers provide by the trampling of beasts in the yard, and by driving their carts over the dunghills. With plenty of litter there need be no smell, even in a yard where eighty hogs are being fatted at once, as I have often experienced, but the pleasant scent of fresh wheat-straw. Dry hot weather is the time when most waste occurs; and then it would be well, certainly, to screw a hose on the pump, and distribute water over the yard: for though chemists differ as to the changes to which farmyard dung undergoes, all agree as to the utility of water in diminishing the volatility of the ammonia. They agree that the urea, in the first place, is a fixed salt, and that it becomes volatile as ammonia, but in what mode they do not agree. They also agree, which is important, that in well-made dung more or less of this volatile ammonia is, in some unknown way, brought again into a fixed state. Sprengel thinks this is brought about by humic acid, arising from the decomposition of straw. Liebig denies the existence of such an acid, but says that decayed woody fibre has the power of absorbing ammonia to seven hundred times its own bulk.

Much ammonia, it seems likely, must be fixed in some way, because in dunghills which are ripe, and yet not decayed, one perceives little or no pungency of scent, while practice shows that such dung has not lost its vigour. There is danger then that, after all, in applying the liquid portion apart we may dissipate the very essence we are seeking to save, which would otherwise have been fixed by a natural process. Supposing, however, that we adhere to the old practice of making dung in farm-yards with the help of the rain from heaven, there remains the objection that the supply is sometimes in excess, and that a black stream runs away into some neighbouring ditch. This picture, a very common one, is, I think, somewhat overdrawn; or rather, is sketched from dairy farms, where litter is scarce. On arable farms I doubt if the waste be very great. Much will depend, of course, on the average amount of rain, which varies, as we have seen, in different counties. I have no experience on the matter, because my own yards have their vent upon catch-meadows, over which the waste fluid is dispersed by the stream that runs through each yard; but Mr. Thompson's plan for a tank, as improved by Mr. Hannam,* seems perfect. The farm-yard should be hollow in one part, and drains from the stables may empty into this part. Here straw may accumulate, and be steeped in the muckwater. To prevent its overflow, a drain should be led from the upper level of this hollow to a tank out of the yard, and by the side or in the centre of a paved hollow, like a shallow gravel pit. When the yard is cleared the dung can be deposited in this pit, and the liquid from the tank be pumped over it as occasion requires. I should add a well, in case of dry weather, when the liquid in the tank might not suffice to keep the heap moist without the use of plain water. "Plain water," says Mr. Thompson, "has been found to answer exceedingly well." When the manure is to remain long in the pit, it is covered with soil, and both moisture and gas are so completely retained, that nine people in ten might walk unconsciously over it.

A still simpler plan, I think, would be the following. Let the straw-yard be shaped hollow to the centre, like a shallow dish. In the centre might be the tank, surrounded by a low wall, and from thence, with a pump and hose, you might easily return the fluid drainings upon the straw. If perfection be sought in fixing ammonia, a little sulphuric acid might be poured into the tank. If there be occasion to lead manure straight from the yard to a heap in the field, I strongly recommend a foundation of road-dirt or earth, which will absorb the escaping fluids, and serve excellently afterwards to be drilled with artificial manures.

Some farmers are trying the cutting up of their litter, so as to apply the manure at once to the land. The difficulty which I see is in always finding land ready to receive manure. The manure is applied of course unfermented. Now, so far as we know, manure must be fermented; that is, the urea must become ammonia, before it can become the food of plants. Still this forms no objection, because the transformation doubtless will take place under ground. The box-feeding system seems to have been firmly established by Mr. Warnes for *fatting* beasts. The box, about nine feet square, is sunk two feet in the ground, and is itself the tank, in which the animal rises upon his own litter, until his head touches the ceiling. Here the principle of pressure is relied upon singly for retaining ammonia. Care is requisite in supplying the litter; for if given too freely, it heats; if not frequently enough, the air is tainted. So, on a large scale in Lincolnshire, the folding gates between yards are hung a yard high from the ground, and the straw accumulating is trodden down in the open yard by young cattle.

Whether sheep dung should be made artificially, under sheds upon boards, seems to me a doubtful matter. I have left off shedding my own sheep, having found that of two weighed lots the shedded lot did rather the best in January, and the folded lot in March. The sheep certainly has a good great coat provided by nature, which, moreover, cannot be curried in confinement like the hide of a cow. My shepherd says that the sheep fat fastest in clear frosty weather, because they eat more; and this is quite reconcilable with theory, if animals find fat ready made in their food as they do muscle, because, while taking in more fuel, they would take in more fat. It would be like an express-train, which uses more coals, but goes faster. On the other hand, I know as a certain fact, that sheep which have been kept very warm in sheds upon boards, have eaten certainly very little, but have also been exceedingly slow in laying on fat. But, as yet, theory is at fault on this matter. Wet weather is what throws sheep back, and then they must thrive best under cover, though the alternation cannot be well reconciled with the animal's health, so that we must decide one way or other, but which way seems to me as yet problematical. The balance seems to turn in favour of field-feeding on light-land farms, yet there is some waste of manure in feeding off turnips upon the ground, if the crop be a full one and artificial food be employed. Even if ploughed as close as possible up to the fold, the plough cannot come in until a whole length is cleared from end to end. Meanwhile, the loss of manure has been in great part incurred. Every farmer knows the pungent stench which proceeds, in dry weather, from a fold of high-fed sheep; but in a few days, before the land can be ploughed, this disappears, and with it ammonia has fled. Sheep-manure is, in fact, peculiarly liable to this waste; for the solid proceeds from sheep contain ammonia as well as the liquid, and both ferment immediately. The remedy lies in using the breast-plough to turn over a thin paring of soil by hand, as fast as the hurdles are shifted. It costs, perhaps, 5s. per acre; but this is no extra expense, because it saves the second ploughing, which is otherwise needed to mix the manure equally through the land: an essential point, I need not say, for the barley crop. I am determined in future to breast-plough when possible, even within the fold; for the health of the sheep sometimes suffers, though in the open air, from this intense escape of ammonia. Professor Way, I may mention, has illustrated this evil; for he has ascertained that the soil of my own farm has the hitherto unknown property, that when mixed with fresh urine it hastens the fermentation by two or three days, which clay on the other hand retards or prevents altogether. Many other soils no doubt have the same property; but once buried, the ammonia is of course safe, and this practice of following the fold with the breast-plough is found to answer in Oxfordshire and Gloucestershire, where it is used regularly by many farmers.

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* See Mr. Hannam's account, reprinted at the end of this paper, from the Journal of Yorkshire Agricultural Society, 1843.

On the management of manure generally, it seems to me not that we should adhere rigidly to our present system, but that before this system undergoes a radical revolution, the various transformations of animal manure require to be traced by chemistry, with accurate investigation of its different stages, and that these results must be introduced into our practice, subject to the health of animals, and to the seasons at which manure is required. We are thus brought to actual cultivation. Before we consider, however, what a farmer *should* grow, the question arises, what he *may* grow, according to the covenants of his lease.

Covenants.

It is generally felt that some change is required in the covenants which govern the rotation of crops; but, though they are often discussed, I do not think the principle which ought to govern them is stated quite plainly. The agreements generally lay down what a tenant should grow. Under the usual, or four-course, rotation he is bound down to the well-known succession—first, wheat; second, roots; third, barley; fourth, grasses (that is, clovers and rye-grass, called "seeds")—and he is forbidden to sell hay or straw from the farm; nothing, by-the-bye, being said about selling roots. Now here is a fault one cannot but find. Under this agreement a farmer must not grow peas in the second year; yet a good farmer might be inclined to grow peas, followed by turnips in the same year. If he gave those peas to his sheep while eating the turnips, he could not do a better thing for his land than what this agreement forbids him to do. A bad farmer, on the other hand, having his land—very light land, perhaps—in rye-grass, might let a large portion stand for seed, thresh the seed, and take it to market. On such land he could not do a worse thing for the succeeding wheat crop; but the proceeding would be perfectly regular: so imperfect are our present agreements in both directions, for the good farmer and bad one. They look merely to what is *grown* on the farm, while the farm is impoverished only by what is *sold* from it. It is hard, too, to prevent a farmer from sowing spring wheat instead of barley. The justice of the case between landlord and tenant on light stock land, I speak of that only, would be met by the principle, that no vegetable produce should be sold off the farm, except white corn, and that no two white crops should be grown in succession. Whether this would be agreeable to tenants, I cannot tell; but for good farmers it would be evidently better than the present restrictions, and juster. Not that these terms are at all universally applicable. Good strong land is able to send beans largely to market, besides white corn, and in fact must do so, as it cannot support and does not require so much live stock as lighter land. Even the interval of a year between two white crops must suffer exception, since for some unknown reason, in many places, as parts of Sussex and of Lancashire, barley seems to answer best after wheat, and there consequently you must take two white crops and two green crops together. In South Wales, I find, by the most recent and comprehensive authority on the subject, Winsgrove Cook on "Agricultural Tenancies," the farmers do not like any conditions more stringent than this, "that they should not grow *more than four white crops* in succession." One hardly sees, indeed, how they *could*. Vain, however, as it may be to lay down any general rules, the principle of sale, rather than growth, though not to be rigidly enforced, clearly lies at the root of the matter, and therefore should not be lost sight of.

Foulness of Land.

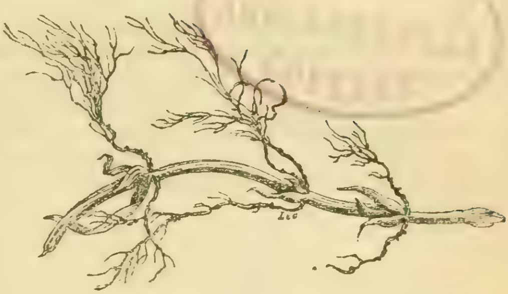
We are now arrived at actual farming, and the first point is cleanness of farming. Much as we hear of foulness of land, I never met with any distinct statement of its evils or remedies. Common, therefore, as the subject itself may seem, it will be worth while to clear up this matter. There are three distinct families of weeds: 1, annual; 2, weeds with tap-roots; 3, weeds with creeping roots; and these three very different races require to be dealt with in entirely different ways. First, there are the annuals, more unsightly than mischievous, unless from extraordinary negligence. One of these, however—the charlock—has gained the mastery of a particular district, the South Down Hills. I remember it in 1804 covering the fields near Brighton with a yellow blaze, and filling the air with a sickly odour; and still it may be seen along that range, sometimes even in June, overtopping the barley, the crop of which it must diminish by a quarter of an acre. Its prevalence there arises from the growth of rape, unhoed, instead of turnips; and the seeds, once ripened, being oily, may lie for years underground without injury, until they are once more brought to the surface. They should be removed by bringing fresh seeds to the surface, allowing these to shoot, and burying them again with successive ploughings and harrowings. Drilling the rape and hoeing would prevent their recurrence. But the yellow hue of the barley fields is not confined to Sussex, or due only to rape; for Mr. Jonas, a practical farmer, in his excellent report on Cambridgeshire, is put to the blush by the charlock in his own neighbourhood:

> "Here I must admit I am quite ashamed of my county; for, notwithstanding its most excellent farming in many parts, we still continue to be disgusted in spring by whole fields of barley as yellow as saffron from the charlock in blossom; whereas, by strict attention for a few years, never allowing a head to seed, they might be, as I have known them to be, completely eradicated."

Another gregarious annual with oily seeds, the wild flax, has been found equally injurious to barley near Cannock Chase. The corn marigold I have known a serious nuisance upon very superior sandy soil, and have seen it removed by a moderate dressing of lime. Chickweed almost stops cultivation on some fen-land in Somersetshire; nor do I know a remedy, because, hoe it as you please, the slightest shower sets it again. Annuals, however, in general are easily dealt with: not so the tap-rooted plants, of which the dock is a sample, often to be seen upon slovenly farms proudly waving its banner over the harvest-field. These are anchored in the subsoil with a slender, carrot-shaped root, against which neither pulling nor ploughing avails, for though broken or cut, it shoots up again. The only remedy, as I know by experience, is to keep an old man at work for several winters digging them up with a paddle. Yet these root weeds are again more ugly than mischievous. They strike a stranger, but the real injury and loss arise from what, if unacquainted with farming, he might mistake for harmless grass coming up in the wheat-stubble. Every farmer will know that I mean couch-grass. This brings us to what I regard as the most important change required in south country farming, which it will therefore be worth while to consider minutely: I mean

Autumn Cleaning of Wheat Stubbles.

The peculiarity of couch-grass* lies in its long jointed roots, like the runners of strawberries; but these are underground runners, with joints at every inch, from each of which other small fibrous roots issue. The main roots may be a foot or two long, and, if broken, each joint is as ready to grow again as a potato-set with an eye in it. If the land be wet, you cannot get the couch out with the harrow; if you attempt to do so and fail, you break the couch, cut the runners, spread the joints, and thus increase, instead of diminishing, your untoward crop. The old fashion of naked summer fallows is still retained upon very strong clays on account of this weed, because the clods, when dry, are so hard that the couch will not come out, and they are therefore left to roast in the sun until they are dried through, and it perishes for want of moisture. On stock land in the four-course system this process of cleansing takes place between the growth of wheat and of turnips, and involves more labour than does the mere cultivation of the other three years together. The usual method has been to let the sheep range over the grassy stubbles in autumn, and give the land a winter ploughing towards Christmas. In dry spring weather, it is again ploughed to bring the couch uppermost, drag-harrowed with three or four horses to break the furrows, scarified with four or five horses to bring up the long roots, heavy rolled with three or four to squeeze the clods, light harrowed, light rolled again, light harrowed again, then all the hands turn out with rakes to gather this unravelled network, heap it, and burn it. But if the ground be really foul you have not done yet. After a few days you see fresh blades of grass shooting up over the bare ground, and find the enemy still left behind; so that the ploughing, harrowing, rolling, raking, and burning must begin over again—very likely be repeated a third time. All this I have done, and done for the last time. Every farmer knows the process well. Sometimes it interferes with the barley sowing—a critical matter; sometimes the barley sowing interferes with it; sometimes the weather is wet, and it cannot be done; often there is a long drought, and the ground is rendered so dusty that it never again becomes moist enough as a seed-bed for turnips. All these well-known disadvantages are in attendance. But to prove the



Fragment of the underground Runner of Couch-grass.
Natural size.

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* Besides the true couch, *Triticum repens*, there are three species of quitch, or *Agrostis* equally troublesome as having creeping roots, and regarded practically as the same with couch.

absolute expense, I will extract from a standard work, 'Bayldon on the Art of valuing Rents and Tillages'*—his account of the bill to be paid, under a change of tenancy, for this operation; and his charge is estimated, be it observed, not for a field casually foul, but as a regular ingredient of the cost of the entire turnip crop of a farm every year:—

Turnips.	Per Acre.		
	£	s.	d.
First ploughing at Christmas, at the rate of ¾ of an acre a day ……	0	10	0
Second ploughing in the spring, at 1 acre per day………………	0	8	0
Four times of harrowing ……..	0	4	0
Rolling once …………………	0	1	0
Gathering and burning couch ….	0	1	6
Third ploughing………………	0	7	0
Three harrowings ……………	0	3	0
Rolling………………………	0	1	0
Two harrowings ………………	0	2	0
Couching……………………	0	1	9
Fourth ploughing ……………	0	7	0
Harrowing and rolling ……….	0	3	0
Couching, &c., last time ……..	0	1	0
	£2	9	6

On a farm of 200 acres £125 every turnip season.

Now let us hear from Mr. Raynbird what is done by Suffolk farmers. Immediately after harvest the land is broken up with the skim-plough (upwards of 1¼ acres may be thus ploughed in a day); heavy harrows are used to pull the land a little to pieces; the roller to break the clods: the light harrows for collecting the rubbish to be burnt or carried off. The scarifier and harrows go over the ground once more, any straggling pieces of couch-grass are picked up by women and children, and the work is done.† This is a great saving; but another Suffolk farmer, to whose statement I called attention three years ago, goes further yet, a great deal. Mr. Bond says:‡

"In this district the labour of making fallows has within the last few years been greatly diminished by the practice of *forking out the couch grass* before ploughing the wheat-stubbles. By far the greater portion need only be ploughed *once*, as a preparation for the root-crop. Women and children are employed to look over the wheat-stubbles directly after harvest (accompanied by a man to see the work carefully performed) to take out couch-grass and docks. This, on a well-cultivated farm, *from being made a system of*, is quickly and cheaply done."

Cheaply, indeed, according to the Report on Somersetshire, in which Mr. Acland says:

"I saw a field of Mr. Hudson's at Castleacre, in Norfolk, so cleaned at a cost not exceeding 1s. an acre, and had great pleasure, on returning home, to find that two friends and neighbours had long practised something of the same sort. I mentioned the practice to a very good farmer near Sherborne, and was told the thing was *impossible* without a ploughing first."

Impossible, no doubt, if the land be foul; but if the land be well cleaned and *kept* clean (perhaps at first by missing a clover crop) not possible only, but certain. There may be more difficulty in the north, where the harvest is later; but even there, though you may not be able to autumn-clean, if you once clean thoroughly, you certainly may fork on the stubbles, which, at Mr. Hudson's, costs only *one shilling* an acre. As Mr. Bond says that roots may be thus sown on a single ploughing, we may leave 8s. more, as enough for that ploughing, and strike out at once the remainder of Mr. Bayldon's long bill, which will give a saving of £2 an acre upon the turnip-crop, that is, on one quarter of an arable farm—*ten shillings* an acre therefore saved upon the whole farm, and as £1 is the average rent of land in England, a saving of one-half the rent. Let no one hereafter speak of clean farming as expensive farming. What high farming may be remains to be seen. At all events, according to Mr. Bayldon, we have saved *two pounds* per acre to pay for artificial manure on our turnip crop, which we must hope will suffice.

It may be said, I know, that a saving of horse-work at a particular time is not money saved, and this would be true enough; but it so happens that by other means we have saved horse-work at all times. In ploughing all the year round, by reducing 3 horses to 2, and by using scarifiers, &c., instead of ploughing at all; in summer, at harvest, we have seen that 5 horses in carts can do the work of 10 horses in waggons; the same will be nearly true about dung-carts, and here we save horses altogether, at the sorest pinch of all in the spring, when before we wanted to do two things at once—clean our land and sow our barley. I know these things, for I practise them. I had a farm full of couch, and having now made it clean, keep only 9 horses, with an occasional ox-team, on 460 acres, and do not expect to want the oxen in future. Autumn-cleaning, however, does more than dispense with Mr. Bayldon's long bill, which I hope may be read as a curiosity in after years; it brings on—

WINTER CROPPING.

In the south of England we have a very long gap indeed between the wheat-crop and the following crop, the turnip. We begin to reap sometimes in July, we clear the fields in August, and we cannot sow our swedes before June for fear of the mildew, while our turnips are not got in till July, so the land is idle for the best part of an entire year, except that the stubbles, if couchy, feed a few sheep and harbour partridges, whilst the winter fallow affords a sheltered seat for the hare. This is, in fact, unavoidable while the land is full of couch; but root it out, and the gap is filled up at once; so that here is another great saving, since you obtain five crops instead of four for four years' rent. "Rye," says Mr. Bond, "is largely sown, coming soonest to feed. Rye is indispensable to the flockmaster. The land ploughs up after rye in a friable state; beet and turnips are grown quite equal to those on land made a fallow of and worked about in a regular way." The St. John's-day rye is one good variety. Mr. Baker, of Writtle, grows another excellent kind. He recommends that the ground should be harrowed fine, and the rye sown shallow. He cuts it into chaff for horses and cattle, but it is also excellent for sheep; and the more valuable, because coming in April it enables you to finish your swedes at that time, and every farmer knows that to keep the flock on swedes till May is the sure way of spoiling a barley crop. It ought to have 3 cwt. of guano sown with it, which will double or treble the crop; and as Mr. Baker values his crop at £8,* if we set it now only at £4, the 30s. will be amply repaid. Rye being sown in September and October to feed off after turnips, we next, of course, sow winter vetches, drilled with guano to follow the rye. Every one knows there is nothing better to feed weaning lambs with. In fact these matters are so well known to good farmers that I am almost ashamed of describing them; still I wish them to be not only common, but universal, that is on soil suited to them. Swedes will be sown in good time after the rye, and turnips after the vetches.

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* Bayldon's 'Tillages" 6th ed., p. 81.

† For further particulars see Raynbird on "Suffolk Farming," Journal, vol. viii. p. 287.

‡ Pusey on "Autumn Cleaning," Journal, vol. viii. p. 570.

Besides these two feeding-crops there is a grain-crop coming largely into use—winter beans. They are a great favourite in this neighbourhood, and are even substituted sometimes for the spring bean upon real bean land, as being less subject to the black aphis. They are often drilled in close double rows with a wide interval, in which root crops are sown in the spring, mangold-wurzel, or turnips. Mr. Bravender thus describes the process on Lord Bathurst's farm at Cirencester:

"The beans were drilled in double rows, with an interval of 3 feet. In the spring the mangold was planted between the double rows in the centre of the wide space left. At harvest the wurzel was very regular, but not so large in bulb as those planted without beans; but on the beans being removed the wurzel grew very rapidly, and when removed for storing were *little inferior in weight to those where no beans had been planted.*"

The land, of course, was not so clean. Turnips also are sown in the same way, but are not equal to a regular crop, especially if the soil be liable to grow hard. My own plan is now to draw the beans, setting them up widely in rows, plough the land, and sow a fresh crop of turnips at once, which may be done by the middle of July, at the same time when other farmers are sowing their regular crop of turnips. There is another winter crop which I am trying this year, and which is as yet little known, if at all—I mean winter peas. They are grown about London, and have also been raised for some years by Mr. Brown, at Purton, in Wiltshire. They too will come off in time for sowing turnips; and Mr. Brown has had a good crop of turnips after them even this year. Thus we have two corn crops, beans and peas, which farmers will admit to be paying crops, and two fodder crops of rye and vetches, which certainly are paying crops when used for sheep; with which four crops we may surely occupy the land and fill up the three seasons which the wisdom of our ancestors set apart for the propagation and extirpation of couch. It is proved, then, that we may grow five crops instead of four in the four years for four years' rent. We may even do a little more. If the land be good and clean the wheat-stubbles can be scratched, and the mustard-seed broadcast before winter beans or peas; only it should be done at once, for mustard will not grow if sown late. There is another excellent plan followed by good farmers, whose wheat-land is clean, namely, to sow hop-clover on the young wheat in March. It may be penned off once by tegs after harvest (but not too close or too late), and in spring it will afford a crop of keep equal to winter vetches, in ample time to be ploughed up for the regular turnip-crop. Again, on many or most soils you cannot get a good clover-crop every four years. There is nothing to prevent you from sowing rye after barley, and mangold-wurzel after rye. Thus on a part of the farm the rotation might stand even thus:

1st year.	Wheat, mustard.
2nd ,,	Winter beans, turnips, or vetches.
3rd ,,	Barley.
4th ,,	Rye, mangold.

This could be only on a part of the farm, but we certainly may obtain the fifth crop pretty generally; nor, as I said, will the beans injure the land if they are used on the farm; on the contrary, they will improve it, and the consumption of the several crops dovetails together. The same lambs, which have been placed with their mothers on the green rye, and when weaned been transferred to the vetches, will afterwards consume the peas and the beans in their troughs on the turnips and swedes, going off fat to Smithfield at about a year from their birth as mutton, but leaving their fleeces behind them.

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* Consult Mr. Baker on "Rye as Green Fodder," Journal, vol. vi. p. 181.

Root Crops.

The culture of swedes differs absolutely in the north and the south of England. In the north they may be sown early in May, in the south you must wait another month, or the hot weather in August will give them the mildew. Hence in the south we cannot grow the crops of this root which are grown in the north. Thus the average prize-crops of swedes in Lancashire have been 40 tons per acre, while in the south we cannot get much beyond 20 tons. If we want to grow 30 tons of roots to the acre, it must be mangold wurzel, the culture of which is spreading, and would spread more but for its impatience of frost, and the farmer's dislike for the trouble of lifting, carting, and storing the crop in the autumn; in yielding to which dislike I yet believe they are wrong, for the orange globe mangold will grow on any light soil, and 200 tons of it are very convenient in May. In setting the seed I adopt Mr. Huxtable's plan so far that, after ploughing in dung, we dibble in by hand a pinch of manure under the seed.* Swedes and turnips, however, must be the mainstay; and with them not only a different season, but a different mode of culture does and must prevail in the north and the south. For the north, the plan of setting them on ridges filled with manure is doubtless the best; but it is too slow a process for us in the south. Sowing in June, we wait for a shower to moisten the ground; then, with a drill 6 feet wide and artificial manure, we can sow four rows at once, and get over 10 acres a-day. Our great difficulty is to secure a plant. Since I followed Mr. Jonas's advice five years ago in doubling the quantity of seed, using 3 or 4 lbs. to the acre, and have also used superphosphate, I have scarcely lost an acre of turnips by the fly, though the fly has sometimes obliged my neighbours to sow two or three times. The superphosphate pushes up the plant quickly into rough leaf, out of the fly's power; and though many be eaten, others take their place, as the seed does not all come up at once. I mention this, because certainty is a very great matter in farming. The next point is economy; and in this too, in looking backward eight years, we have reason to congratulate ourselves on the now general use of sulphuric acid with bones. At first the bones so treated were applied in the liquid form; but the dry form, as I recommended, soon became universal, and superphosphate a common article of commerce. Another method, the putrefaction of bones, is yet more easy to practise. I have found it answer to employ them jointly. The superphosphate pushes on the young plant; the fermented bones feed the tuber as it is formed. The immediate economy effected, in giving an adequate dose per acre, may be stated roughly as follows:

	Cost of each of the four applications. £	s.	d.
16 bushels bones	2	2	0
8 bushels bones fermented	1	1	0
3 cwt. superphosphate	1	1	0
1½ cwt. superphosphate, 4 bushels fermented bones	1	1	0

All these doses are rather low; but the *proportion* I believe to be just. Here, then, is a most important reduction in one of the two principal charges of high farming, the yearly bone bill. If we double the dose, as is my own practice, and use 5 cwts. per acre, we are within the sum saved from Mr. Bayldon's couch bill, for which credit, as the reader may recollect, was reserved at the time, and have therefore a right to say that so far *high* as well as *clean* farming is not more expensive than foul farming. The cost is the same; the produce, of course, very different. This, however, by the bye. The turnips come up very quickly and thickly, so that no time must be lost in singling them out. Mr. Jonas advises that a harrow should be drawn across the rows to separate them for the hoers. I find it also a good plan not to let the hoers delay for absolutely *singling* each plant, a tedious matter in thick sowing, but that they should rather strike once with the hoe, leaving the singling to be finished by a troop of children from six years old upwards, who, with their fingers, at 2d. or 3d. a-day, if well looked after, earn their pay well, and are not sorry to leave school for the purpose. From this time Garrett's horse-hoe, exactly fitting the width of the drill, is kept at work as often as wanted, until the leaves meet, and beautiful work it makes. I would as soon be without a drill as without this implement on my farm. Every farmer knows that a turnip crop is often seriously injured in harvest time for want of hoeing by the hands which are busy with reaping; all which anxiety is cured by a pair of horses and man kept specially at work with this horse-hoe. The crop being well grown, it only remains to feed it well off. To say that for the fatting flock this should be done with the turnip-cutter, which, by saving exertion to the sheep, saves waste of his vital force, and therefore saves food, will sound to most farmers like telling them to plough their land. Still there are districts where even the turnip-cutter is unknown. I have therefore endeavoured to ascertain the profit of turnip-cutting. "If, of two lots of lambs, the one received, during winter, cut turnips, the other uncut turnips, the fold with cut turnips would be worth 20 per cent. more than the other fold. The former would sell for forty shillings a-head, if the latter fetched thirty-two shillings, and the cost of cutting would be *one* shilling per head, leaving *seven* shillings clear profit upon each sheep." If this statement had been made by an amateur agriculturist, one would have been rather sceptical. It was given to me word for word by two experienced practical farmers; and I only write it down from their mouths for the consideration of their brethren in any benighted districts of England, or even Scotland, if such yet there be. Let them consider that 7s. per sheep upon turnips comes to 70s. per acre upon the turnip crop, nearly the average rent of land for the four years' course, till the turnips come round again. And what is the investment of capital? *Five pounds* for one best Banbury turnip-cutter, which will last for five years. We ought to hear no more of the extravagance of high farming. Your real spendthrift farmer is the man—penny wise and pound foolish—who gives whole turnips to tegs, and indulges in the luxury of couch on his fallows. Everybody, too, knows that mutton may now be grown in one year instead of four; and it would be idle to dwell on the excellence of our three great breeds; but it is not so well known how well half-bred sheep answer for early feeding. Thus, from a West Down ewe and a Leicester sire you obtain a teg, with the early maturity of the father and the flavour of the Down breed, consequently fetching something near the top-price in the market. Nay, more, what I do not pretend to explain: it seems that the offspring of the long-wooled and short-wooled parent carries a heavier fleece than either. This cross, I know by experience, pays well. There is another cross in Shropshire highly spoken of. In Northumberland they cross between the Leicester and Cheviot ewes; and Mr. Colbeck says that the lambs are better shaped, and make better meat than either breed pure.* There is this further advantage sometimes in crossing, that the ewe may be of a breed that can bear hard living upon poor bleak mountain pasture, quite unfitted for the improved breeds. In this way a Welsh ewe might be kept on the moors for eight months in the year, yet her lamb have many qualities of the improved Leicester.

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* See an account of the practice on Mr. Dickenson's farm in the Report on Somersetshire.

But to return to feeding the lambs. Of course, instead of hay with their turnips they will now have cut straw: and it is very satisfactory to see a barley rick after threshing thus disappear, being minced at once by the chaff-cutter, with the aid of one horse, into a mountain of chaff, which remains in the barn sufficient to last a good flock for three weeks. They must also have oil-cake, the other heavy item besides bones in the account of high farming. Now, I do not say that no additional capital is required for cake; but this I do say: farmers found it answer some years since to pay £12 per ton for linseed cake, which is now fallen to £7 or £8; and further, I must beg to repeat what was published by me in this Journal three years ago—sheep thrive as fast upon the best London-made rape-cake as upon linseed-cake, and for such rape-cake I have paid hitherto £4 10s. This is really a useful thing for farmers to know; but they must not do as one gentleman told me he had done, give his beast rape-dust, a substance resembling bad mustard-flour. Now if it answered to give sheep cake a few years ago, at £12 per ton, surely there can be small risk in doing so now at about one-third of the outlay. But further, as to the mere extent of capital in high farming; if the lambs or tegs begin to receive cake in September, they may also certainly begin to go for ready money to Smithfield in January. Now, the customary credit for cake is three months; the money begins therefore to come in almost as soon it goes out. I dwell on this point, because exaggerated notions are abroad among practical farmers, as to the expense of high farming, as it is called. The advocates even of improvement set the capital required for improved farming very high. *Ten* pounds an acre is a floating estimate of the proper capital. Farming myself of course high, I cannot bring my own investment to more than *six* pounds an acre, a sum which I believe, with sheep farming, at least, to be an ample allowance for the highest possible farming. A fair capital, I firmly believe, may be made, by plain, common sense, to go nearly, if not quite, as far in good as in slovenly farming. At all events, when we see the bill for bones and for cake reduced by fully one-half, we need not be frightened from good farming by the cost of a few score of ewes to add to our breeding flock; for this is what it comes to at last.

Besides turnips and mangold, other winter fodder crops have been tried. The white carrot is less afraid of drought than the turnip, because its deep root always burrows into moist ground, but he is rather troublesome, from the necessity to dig him up, and to store him; yet as 30 tons may be grown to the acre, the white carrot should not be abandoned upon free sandy loams. The kohl-rabi, which looks like a swede standing upon a peg, is free from the swede's great enemy, mildew; is said to give a large weight per acre, and is so sweet that it is preferred by sheep to the swede. I have tried it two years, but cannot speak positively about the yield, because the seed, which comes from Germany, comprised five or six varieties of the kohl, besides two or three kinds of cabbages. The red variety seems very bad; the pale green the best, having a very large bulb, with a very delicate leaf. The potato is well known to suit the west side of England; and as food for pigs does not suffer greatly from a moderate attack of the too famous disease, since they eat it when steamed; and steaming is necessary even for sound potatoes, as they consist largely of starch, the cells of which require to be burst by heat. This is the only kind of farm-cookery about which we may feel certain that it will answer; at least I feel doubtful about steaming straw; but potatoes steamed, mashed, mixed with barley-meal, and left to turn sour, will, I know, fat a hundred hogs well in an open farm-yard. I mention this, because desirable as good buildings are, that work must be a slow one, and we cannot wait until it is done. In agriculture, as in other affairs, shifts must be made. If our cultivation be not improved until all our farmers have ten pounds per acre of capital, and all our landlords have put their buildings in apple-pie order, many of us, I fear, may never begin. There is another tuber, the Jerusalem artichoke, which, as food for stock, may be substituted for potatoes, and does not require to be cooked, because instead of starch it contains a similar but peculiar substance—inuline. Its yield I have found to be on a par with the potato, about 10 tons, and it is equally nutritious. It is a field crop in Alsace; and I have a piece which has stood for five years. It is the least troublesome of all crops, taking care of itself. The roots are dug up when wanted in winter, dreading no frost; and so many remain behind, that you have only to give a ploughing in spring, with a coat of dung, if required. It deserves to be tried on a small scale, in any out-of-the-way field. Returning, however, to regular cropping in the four-course system, we next come to the

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* Report on Northumberland.—Journal, viii., 433.

Second Year.—Barley.

The chief question about barley is the time of sowing, and many farmers now sow it, notwithstanding its tenderness, as early as February, the object being that it should be up high in May, so as to shade the ground and keep that moist in May droughts. Late sown barley will sometimes not grow two feet from the ground. Barley sown in February gives the best quality—sown in April, the largest bulk, that is if no drought ensues. As one chief point in deciding the question must be the power of barley to endure frost, and it is known not to stand through the winter, I ought to put on record a fact which came under my own observation this year. Early in March we had very severe frosts, and one night in particular my self-registering thermometer marked 11° of Fahrenheit, that is, 21° below freezing point, an amount of frost which is not experienced sometimes in a whole winter. My early sown barley was out of the ground in full blade, and I watched it with curiosity, but it did not suffer at all. It might have suffered if the land had been out of condition, for condition has the curious property of enabling grasses, even Italian rye-grass, to withstand frost which they could not otherwise resist, as I have often remarked. To sow thus early we must plough quickly after the fold, and it appears to me that there is little risk in ploughing turnip-land, however miry from sheep, during winter, because the first good frost will reduce it to a fine mould. In spring, indeed, it might grow hard, if ploughed when too wet, and became therefore difficult to render as fine as barley likes its seed-bed to be.

Third Year.—Clover or other Seeds.

I wish I could report any progress in our knowledge of the clover-sickness, by which the growth of clover is almost stopped in some light-land districts of the north, especially Yorkshire, and for which every remedy proposed has hitherto failed. It is only mentioned here in order to stimulate, if possible, further endeavours to fill up this blank in our scientific and practical knowledge. In Cambridgeshire, where the clover-sickness, however, seems not so severe as in Yorkshire, Mr. Jonas says—

> "Many of our best farmers now sow red clover only once in 16 years, getting the seed-shift into the following rotation; 1st. white clover; 2nd. trefoil; 3rd. peas or tares, fed off or seeded; 4th. red clover. Thus only can we now obtain good crops of red clover."

There is another point about clover which deserves chemical inquiry, the use of gypsum upon this crop. In Germany and North America its use is widely prevalent, and the result great. In England it has been known to double the crop of clover, but we cannot tell beforehand where it will answer; nay, on the same field, a farmer informed me it answered on one part and failed on the other. According to Boussingault, it fails on moist land and answers on dry land. If sprinkled during spring in dripping weather, or on a dewy morning, it adheres to the leaf, and has been known to push the plant so as to cover the ground, and keep it moist to this degree, that the gypsed clover becomes a good crop, while the un-gypsed clover is burnt up by the drought. Peat ashes are applied here in the same way with the rising sun, and they consist largely of gypsum. It seems almost certain that this mineral manure is absorbed into the leaf of the plant.

Fourth Year.—Wheat.

There is no crop about which we should be so cautious in speaking as about the wheat crop. If you give a root crop more help than is necessary, you waste so much money unless the manure remain in the ground; but if wheat be over-fed, in a wet season it goes down, or in a dry cold May it is mildewed. Last August I observed, beyond mistake on a close examination, that the better the land the more was the wheat mildewed; the better farmed the same land, the more was it also mildewed, and that the only bright yellow crops, neither mildewed nor laid, were to be found on cold clay lands, rather out of condition. It is evidently impossible, therefore, to propose any general rule for its culture: Mr. Lawes has shown that what it wants is ammonia. All our received wheat manures are in fact nitrogenous—dung, woollen rags, rape-cake, but the test of a practical farmer is to hit the right mean. Any one can make his wheat look green in winter; but the experienced eye does not like it to look grassy at Christmas. Even if it be right then, the east winds of February or March may set it wrong. The plants change colour and disappear, one knows not how—some with the wireworm: at last (I am speaking of light land) large patches of ground become almost bare. Rolling and wheel-pressing are good against this; but the clod-crusher, which dints the ground like a flock of sheep, is the best of all. We may also venture, but with great caution, to top-dress with guano, or even, as is done by one of the best farmers in Norfolk, with about 3 cwt. of nitrate of soda, adding 2 cwt. of salt to strengthen the straw, an effect of salt upon some land that has been known many years, though I have not found it so act upon my own farm. Wheat plants, however, so thinned and so stimulated, are inclined to tiller unduly, whence mildew may follow. If we could eradicate one cause of this failure of plants, the wireworm, we should do much, and of all the methods, one proposed in the last Journal by Mr. Charnock* seems the most promising—a top-dressing of 5 cwt. of rape-cake per acre broken in lumps. The wireworms are said to eat their way into these lumps, and therein to find the grave of a glutton. Be this as it may, the rape-cake, if not a vermifuge, is a certain manure.

Having said so much on the danger of over-manuring wheat, I may now call the farmer's attention to a most important statement, from one who, by his patient research, careful experiments, and faithful reports, has done more than any man living for the safe union of farming and chemistry,—I mean, of course, Mr. Lawes, our highest authority upon such matters. It is well known that in Hertfordshire he has tested the action of manures by growing successive crops of turnips and also of wheat repeated upon the same piece of land, the crops being withdrawn, and no portion of them returned to the ground. The result of his long-continued trials with wheat is as follows:—

"With the prospect of low prices in wheat, it is a question of much importance to know whether money can be profitably laid out in the purchase of artificial manures; I will, therefore, state briefly the results I have obtained upon my own farm in growing wheat for seven successive years in the same field.

"The unmanured portion has varied but little from first to last, growing *seventeen* bushels per acre. No combination of manures or salts, not containing ammonia, has been able materially to increase this amount.

"By means of ammonia, a produce of *thirty-five* to *forty* bushels per acre has been obtained. From four to five pounds of ammonia have generally been supplied to produce each bushel of wheat; and although this amount may not accurately represent the supply of ammonia necessary to produce each bushel upon every soil, still it may be taken as a guide to the quantity required. Upon all soils having a moderate proportion of clay in them, it is advisable to sow the guano in the autumn; two-and-a-half to three hundred weight per acre are sufficient; it should be sifted finely, and sown broadcast at the same time with the seed.

"The cost at which ammonia can be supplied to the soil must therefore be carefully considered, as upon this one point the profit or loss depends. Peruvian guano ought to contain 16 per cent. of ammonia, of which each pound will cost a trifle more than sixpence. At the present price of wheat, guano can therefore be employed with profit."

The unassisted produce of the Rothamstead land, 17 bushels, or 2 quarters per acre, is, I suppose, about the natural produce of our average turnip-lands. The assisted yield is that of the same land under the highest farming, 35 to 40 bushels per acre, or 2 quarters more. The cost of the extra produce per quarter is the price of 36lbs. of ammonia in guano, or 18s. per quarter of wheat. Now be it observed, that the difference of 18s. and 40s. for these additional quarters of wheat is utterly independent of all the expenses of cultivation; those expenses, with rates, tithes, and taxes, must all be incurred if you are content, as I know some farmers are, with 17 bushels per acre. The only deduction from the profit upon the extra quarters is for casting the guano, a mere trifle, and some extra charge for harvest and threshing. So clear a case of advantage, and so conclusive an argument for manuring, was never put upon paper; for instead of intricate and interminable calculations of the cost of breeding or fatting stock to produce manure, the whole question is put in a nutshell: Will you or will you not venture *one* pound at seed-time to get back *two* pounds at harvest? If a bad farmer were told that he could treble his turnip crop, he might dislike buying more sheep for feeding it off; but here is a clear statement of expense which requires no companion outlay—a simple outlay, which begins and ends with itself. A bad farmer may go on with his no crop of turnips still—the whole routine of his farm may remain undisturbed; but I really cannot see how the worst of farmers will escape these extra bushels of wheat. Mr. Lawes, I see, recommends that the guano should be broadcast rather than drilled with the seed. As he has doubtless good reasons for this advice, I may mention that either the sowers of guano should keep a smock-frock on purpose, since it injures the workmen's clothes; or better still, that a dry-manure distributor* should be bought for four pounds. I need scarcely add that the dose of guano must be suited to the condition and strength of each field. The principle alone is fully established.

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* Vol. xi., p. 183. It appears by Mr. Curtis's paper on the Wireworm, that Lord Albemarle also recommended the same remedy.

Such is the improved four-course or rather five-course system. There is one other crop—flax—which must not be passed over before I conclude.

Flax.

Its value, as now grown in Ireland, is rated by Mr. Macadam at £19; the outgoings at £9; the clear profit at *ten* pounds per acre. His prize report,† published by our society, being most complete, and of the highest authority, must be consulted by those who would embark in this branch of husbandry. The obstacle to the wider growth of flax has hitherto been the number of new processes which its preparation involves. The cultivation, indeed, is somewhat peculiar, as in Belgium one may see it weeded by women creeping on their hands and knees; but the fitting it for market requires many unwonted and delicate modes of handling, as rippling to rend off the seed, steeping to rot the stalk, spreading and turning to dry and clean it, bruising to loosen, and scutching to separate the fibre. Upon these its market value greatly depends. It is only by skilled hands they can be well done; and skilled hands will be found only in a district where flax is already grown, or must be introduced by a combined effort of neighbouring landowners. Steeping, indeed, is now performed by a hot water apparatus, and scutching by a mill; but it will not do for these things to be at a distance. If you send away the stems from the farm before steeping, you part with all its manuring matter. These are real difficulties, not insuperable, of course, but which must be weighed before embarking in the growth of flax; unless, indeed, the new processes now under trial, which dispense with steeping, and are even said to convert flax into a substance like cotton-wool, and silk also, should be found to succeed. Then, no doubt, there will be a wide extension in the growth of flax, limited only by the supply of manure; nor would that, in truth, be a limit in our days, because the supply of guano is unlimited. Flax, too, though it requires high preparation, like wheat, is not so fastidious as to soil; it has been grown on an Irish bog, reclaimed but three years, and was sold for £70 per ton; nor is it so tender as wheat in the elevation at which it thrives, having succeeded in county Wicklow at 1,060 feet above the sea, far beyond the level of wheat.

There is one most important point in our favour as to the growth of flax. "Insular countries, or long lines of coast," says Mr. Macadam, "whose position insures a more equable temperature, and a continued supply of moisture from spring til autumn, are found to produce the best flax." Even in Russia, the short, hot, northern summers hurry the growth, and the fibre is coarse, so that the best Russian flax fetches but £48, while the best Belgian reaches £150 or £180 per ton. Hot southern countries, again, alter the character of the plant, making it short and branchy. "Egypt," we are told, "is the only hot country which furnishes any fibre to our market," and that has not passed £44 per ton. The hot summers of Russia and Egypt cause a dryness and brittleness of fibre, and prevents its retaining that elasticity, pliancy, and oiliness which characterise the flaxes of Belgium, Holland, and Ireland. In America, it has not succeeded hitherto for fibre. In some respects, Mr. Macadam says, our climate is even superior to that of Belgium for flax, since in Belgium severe droughts in spring scorch the young flax, and even kill it once in three or four years. It is right, however, to mention, that on one point our own sky is inferior. Flax dreads heavy rain in July, which lodges and discolours the crop. On the whole, it seems clear that our climate is specially adapted to the growth of flax, but some districts more so than others; and it is plain that the better knowledge of our own climate, which meteorology has lately given us, will assist in the selection of favourable localities; thus illustrating remarkably the legitimate application of science to practice, and showing the advantage of storing, as it were, scientific facts, which though of no apparent use now, may be ready for application when wanted.

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* See Implement Report for account of Dr. Newington's dry-manure distributor.

† Macadam on the Growth of Flax, Journal viii., 361. Also Nicholls on Flax, viii., 438.

Such are the main points of improvement which twelve years have brought to our knowledge, many of them not new, but true, as founded on long experience, yet many also new, but equally certain. Every soil, it appears, may be improved cheaply if suitably treated. If the landlord cannot spare the money out of his income, the tenant should endeavour to find it on sufficient security out of his capital. The tenant's improvements, again, are cheap as well as effective; and high farming I have endeavoured to prove is not extravagant farming. But a slur is cast on agricultural improvement, because it is said those who practise it do not make it answer. Now the notable cases of improvement are those of gentlemen who farm their own land. They are apt to be misled by crotchets, but the chief defect is the want of active inspection kept alive by dependence upon the farm for support. While they are asleep or absent their labourers are idling; when they buy their stock or sell it, they buy in the dearest market and sell in the cheapest, and they have no check upon their accounts. One of our greatest agriculturists held his farm without gain, as Lord Spencer told me, for a long course of years, yet was offered for it by his own manager at last a rent of £1,000 a-year. That gentleman's tenants meanwhile, by the same improvements, were growing wealthy. There is, however, even for an amateur farmer, one certain test by which he may know whether a practice he adopts be an improvement or not: the test of the practice of the best farmers. Do good farmers buy bones at such a price? If super-phosphate cost one-half and act as well, it must pay better. Do they buy linseed-cake? Then if rape-cake at half the price feed the sheep quite as fast, it pays better. There is, indeed, a source of loss which lies in the *misapplication* of practices, as when some one complains that he has ploughed ten inches deep for wheat and has got a bad crop, while we know that wheat requires a hard bed; or in the transfer of systems, as from an eastern corn-growing county to the mountains of Wales. A gentleman, who farms on principle, or still worse, on system, will be lucky indeed if he pays his own rent. In the worst-farmed district among the least enlightened farmers, if I sought to improve them, I should begin by finding out what are their prejudices, for in those prejudices will lie the peculiarities of the soil and the climate, so that in Wales an improvement of the worst Welsh farming may beat Ickleton or Castleacre transferred to the mountain sides. Books will not teach farming; but if they describe the practices of the best farmers, they will make men think, and show where to learn it. If our farmers will inquire what is done by the foremost of them, they will themselves write such a book of agricultural improvement as never was written elsewhere, in legible characters, with good straight furrows, on the broad page of England.

Pusey, November 22nd, 1850.

NOTE.

On the Formation of Tanks; extracted from Mr. Hannam's Paper an Waste Manures.—Journal of Yorkshire Agricultural Society, No. 6.

"Mr. H. S. Thompson, of Kirby Hall, at the late meeting of the Yorkshire Agricultural Society, at Doncaster, recommended the plan he adopted, which was 'to have a pit dug in the earth in which to throw the manure, instead of having it piled up on a heap. The bottom of the pit is water-tight, and has a slope towards the centre, where a tank is placed so as to receive the drainings from the manure. These drainings are frequently poured over the manure, so as to keep up a regular, but not excessive fermentation. He was in the habit of collecting all the couch-grass, stubble, and other vegetable refuse which the farm afforded, and spreading it on the bottom of the pit to the depth of six or eight inches. This, when well soaked with the liquor that drained from the manure which was carted upon it, and fermented together with that manure, was, he believed, as good as any other portion of the heap. In this way he had last year on a farm of two hundred acres of arable land increased his manure by two hundred single-horse loads, which was equivalent to four additional loads per acre for his fallow crops. If the manure was wanted for immediate use, it should be lightly thrown together, and after being well soaked with tank liquor, have a thin covering of soil to absorb the gases which would otherwise escape. In this case it must be carefully watched and well watered, from time to time, to prevent the fermentation from becoming excessive. If the manure is to be kept six months or more, it should be made solid by carting over it, and have a thick covering of soil, which would nearly exclude the air. In this way manure may be preserved for a year almost without loss. In very dry weather, the drainings from the manure are not sufficient to keep it moist, and it becomes necessary to saturate it with some other liquid. If the farmer has other tanks on his premises, it would be better to use their contents for this purpose; but where such are not at hand, plain water may be used, and has been found to answer exceedingly well.'

"Having had the pleasure of examining this process, I may add in explanation, that the pit is merely an excavation, similar to a shallow gravel quarry, one side being sloped away for the purpose of convenience in emptying it of manure; hence the cost would be slight. In some situations the gravel taken out would pay for the labour, in others the soil would be of great use, for the purpose of covering the manure (when intended to be kept fresh), or as an absorbent for the liquid and gaseous waste.

"Mr. Thompson's pit is so formed that the liquid filters gradually into a small well or tank, at the bottom of the excavation—this tank being merely a cutting, about six feet deep, six long, and three wide. Of course, when the compost is made in the pit, the tank is left uncovered, the manure being piled round it, so that the liquid may be laded out and spread upon the compost. When the manure has to remain in the pit for a length of time, it is generally covered with soil and other absorbent matters, by which means it is kept fresh. Indeed, so well is the object effected, and all *gaseous* escape prevented, that nine out of ten individuals would walk over the pit without knowing that there was such a store of rich manure under their feet.

"Mr. T. has also a capacious tank, in which the liquid from the sheds and the yard is collected. This tank, however, is totally unconnected with the compost pit.

"Of the various plans which we have examined, Mr. Thompson's is most entitled to our notice. And this not merely because it is in practical operation, and has shown beneficial results of which we have abundant evidence, but because it is calculated to secure each of the advantages flowing from the other methods, without their disadvantages. For instance, it affords us the means, not only of collecting the waste fertilizers, but also of preserving them, and of using them in conformity with the principle best adapted to English agriculture, viz., *that of concentrating them as far as possible in our farm-yard compost, or using them singly, at option.*

"In the *modus operandi* of this plan there are, however, certain defects. They do not belong to the system, but are errors of arrangement, and as such may be remedied. One of these errors is in the position and locality of the liquid manure tank, which is at some distance from the compost-pit. Owing to this circumstance the solid manure is only *saturated with the liquid that it brings with it from the yard,* except at the expense of extra cartage from the tank. In cases, therefore when the drainings from the pit are not sufficient to moisten the compost (a circumstance which Mr. Thompson states does happen), or when we may have a quantity of dry vegetable matter, which is slow of decomposition, to form into compost, we must either take the trouble of frequently carrying the liquid from the tank to the pit or (what *may* be equally troublesome, and must be always a bad practice, when liquid from the yard can by any means be obtained) adopt Mr. T.'s own alternative, and '*use plain water.*'

"Were the tank formed near the pit, this evil would be removed;* the drainings from the fold-yard would be quite sufficient for saturating the compost, and the work would be performed with little trouble. It may be said that nothing can be done *without trouble,* and that the carriage of the liquid would be amply repaid in this case. This may be true; but let it not be forgotten, that, strictly speaking, if we are ever so well remunerated for spending a week over any work, we are much better paid if by any means we can perform it in half the time. But it is not on this account that unnecessary trouble is objectionable in a plan like this, but *because it too often leads to more serious evils.* Thus, say we have a compost requiring frequent applications of the liquid, and it is a work demanding a little extra preparation; it is perhaps accomplished once properly; next time, however, it may happen that we are busy, and it is hurried over, and only half done; on the next occasion, perhaps, time cannot be found to attempt to do it; and so on, till at last it is forgotten altogether. We do not say that this would be a common case; when, however, we can so easily prevent the probability of it happening at all, it is our duty so to do.

"Having now seen upon what principle our system of economy should be based, and how far the various measures proposed are calculated to carry out that principle, we are in a situation to say how, and by what particular means, that object may be generally effected, and the waste manure of every farm properly economised. To accomplish this thoroughly will require an arrangement more comprehensive than any yet detailed. A careful examination, however, of the advantages and disadvantages of the preceding plans warrants us in asserting that it may be done, both effectually and economically, by attending to the following suggestions:—

"1. Let all the buildings round the farmyard and strawfold be sprouted, and the delivering tubes so arranged that the water may be made to flow into the yard or not, at the option of the farmer. This may be effected by bringing the end of the spout over a drain, which may be left open or closed, as he may wish the water to escape from the yard or not.

"2. Let the farmyard, if possible, be made slightly concave, so that the liquid may permeate the mass, and make to the centre.

"3. Make drains from every stable, cowshed, &c., and from the kitchen into the manure yard.

"4. Select a shady place, if possible, on the north side of a hedge or wall, where it is convenient to cart the manure to, when it is removed during winter and spring from the fold. Mark out a surface sufficiently large to hold in a heap all the manure made during winter, and form a compost couch of this size, and two feet deep. Divide this couch into three sections, by two rows of flags or bricks. Make the bottom of each couch incline, so that the liquid from the manure may gradually fall to the front side.

"5. Next cut a drain alongside, and in front of the couch, with an inlet from each division, through which the liquid may flow into the drain, and fix a sluice at each inlet.

"6. Make a capacious tank, on any convenient side of the couch, and connect it with the drain which runs alongside the couch, so that the liquid from the couch may run into the tank.

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* Mr. Hannam's criticism is just; but the arrangement he complains of could not, in my case, be avoided, as my tanks we made before I had even conceived the idea of making a manure pit, and the ground would not admit of the manure pit being made in the immediate vicinity of the tanks.—H.S.T.

"7. Make a drain from the bottom of the farm-yard into the tank, and fix a sluice, so that the liquid from the yard may be let into the tank or not, at pleasure.

"8. Fix a pump over the tank, and connect the nozzle with a wooden spout, fixed so as to traverse above each division of the couch.

"9. Bore a hole through the spout over each section of the couch; in each hole put a plug on the top side of the spout; also over each hole affix on the under side of the spout a leathern nozzle or delivering tube, two or three feet long; by means of which arrangements the liquid from the tank may be directed to any part of the couch.

"These arrangements may be made at a slight expense, in almost any locality, and worked with little trouble by the farmer, so as to give him a perfect command over his manure; that is, to enable him not only *to preserve the fertilizers which are usually wasted, and to concentrate them in the form of compost or otherwise, at pleasure;* but also to *make and preserve* this compost *for any length of time, in whatever condition he may think fit.*

"Thus, to PREVENT WASTE, the process is as follows:—The liquid drainage from the sheds and house, which is not wanted in the yard, and also that from the manure when carted out of the yard into the couch, is collected in the tank. One section of the couch forms a place of deposit for all *vegetable refuse* which can be gathered together; while *gaseous waste,* arising from too active fermentation in the cattle-yard, may be prevented by the power which the spouts and sluice-drain give us of keeping the manure dry or wet at pleasure; for, be it remembered, that while a little moisture encourages decomposition, a liberal supply prevents or retards it, and also absorbs a large portion of the ammonia which is evolved during the decomposition which does take place; for ammonia and all its compounds are easily soluble. When, therefore, the manure is led out of the yard by placing it in one section of the couch, we can, if we wish the manure to be kept fresh, have a liberal supply of liquid from the tank, and can let it remain in the couch as long as we think fit, by keeping the sluice at the junction of the couch, and the drain which leads to the tank, closed. By carting over the heap, making it as solid as possible, and covering it up with ashes, charcoal, peat, earth, or any other absorbent, the loss of ammonia will be very slight. When, however, we require the manure in the couch to undergo very quick and active fermentation, and are compelled to throw the manure lightly together, and to drain away unnecessary moisture, our best method of preventing *gaseous escape* is to cover the heap lightly over with ashes, sawdust, peat, charcoal, or other absorbent, and to keep this coating well saturated with sulphuric acid and water, say a weak mixture of ten gallons of water to one of acid.....

"To COMBINE THE VARIOUS WASTE MATTERS *with our ordinary compost,* the system affords us every facility. Thus, the *liquid* from all the buildings flowing into the tank, we have nothing more to do than to lead our manure from the yard upon one of the beds of the couch, where we can, by taking out the plug from the spout over the portion we wish to saturate, pump upon it, if we think proper, the whole contents of the tank. With this compost we can also mix the *waste vegetable and other refuse,* which have been collected in the other section of the couch, or can, by opening the spout from the pump, make a compost of it, with the liquid from the tank only. The *gaseous matters* are in this or other cases preserved and combined with the bulk of the compost by the means before detailed.

"To make and preserve *our compost manure in whatever condition we may wish it to be for any length of time,* is another of the advantages which we have said the system gives us, and it is thus secured. In the farmyard, by opening the spouts and stopping the drain leading to the tank, or *vice versâ,* we can retard or accelerate the decomposition of any vegetable matter; and, when we think fit, can lead it out into the couch, where we prepare it, and preserve it in any condition we may think proper. Thus say we have one portion which we wish to keep fresh for a length of time; we have nothing more to do than to saturate it well with the liquid from the pump, and to keep it pressed down and thoroughly wet, and covered with earth or vegetable refuse, so that the atmosphere cannot have access to it, when our object will be effected. Another portion, which we may wish *to decompose thoroughly,* we can place in the other section of the couch, throwing it lightly together, and frequently applying the liquid from the tank. In this case the drain from the couch should be open, in order that it may return all the liquid that the compost does not absorb, and thus keep the manure from being too wet. Again, *to make our compost in as good a condition as it can be* for use, we can saturate it thoroughly with the liquid from the tank, and apply it in as wet a condition as possible. By this means we excite a fresh action in the manure, which is of immediate benefit to the young crop (especially to turnips and green crops), and convey a stock of liquid food with scarcely any extra carriage. My own experiments (p. 49), those of the late Arthur Young (p. 48), and the practice of the Flemings (who moisten the small heaps of compost laid out at regular distances in the field, and as soon as they begin to heat plough them in),* are proofs of the beneficial effects of this process.

"In executing these various processes, the means which have been laid down for the prevention of gaseous waste may be employed. And, lastly, after having *preserved all waste; concentrated as far as possible the fertilizing matters of the farm in our manure heaps; preserved them as long as we think proper; and applied them in the condition best adapted* to promote vegetation, our *tank* supplies us with the means of applying a *liquid* dressing to any light sandy soil, or to any crop which we think requires it, or whenever our solid matters for making compost are exhausted."

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* Agriculture of the Netherlands, Royal Journal, vol. ii., p. 57.

THE LONDON FARMERS' CLUB.

THE ADULTERATIONS OF ARTIFICIAL MANURES, AND THE BEST PRACTICAL MEANS OF DETECTION.

The usual monthly meeting of the Club took place at the Club Rooms, Bridge-street, Blackfriars, on Monday, March 3. Subject, "The Adulterations of Artificial Manures, and the best practical Means of Detection." The subject was introduced by Mr. J. C. Nesbit, F.C.S., F.G.S., &c., one of the Principals of the Agricultural and Scientific School, Kennington. The chair was taken, in the absence of Mr. Thomas, by Mr. Payne, of Felmersham.

The Chairman having briefly alluded to the topic,

Mr. NESBIT said: Mr. Chairman and gentlemen, the subject which I have the honour of introducing to your notice this evening, namely, "the adulterations of artificial manures, and the best practical means of detection," is, I think, almost as important a subject as could at any time be brought under the consideration of practical farmers. The time is past when farmers were compelled to depend for their manures solely upon those articles which they can produce upon the farm. By practical analyses of the manures used in cultivation, it has been found that certain substances constitute the chief ingredients which are capable of giving fertility to the soil; and, as you are well aware, numerous other substances, either obtained from our manufacturers or brought from abroad, such as nitrate of soda and guano, are used for the purpose of agricultural improvement. It is of immense importance that the articles thus brought to your doors should be received by you in a state of integrity, that they should not be adulterated, and that if they are adulterated, you should have in your hands means of detecting adulterations, and of avoiding the consequent loss. Now I shall endeavour, gentlemen, this evening, in the first place to show you what good manures consist of, what are their principal constituents, and afterwards to give you the whole history of the adulteration of manures, showing you how and where they are adulterated. I dare not mention the names of parties, at least it would not be prudent to do so; I shall merely give such evidence as to the extent of adulterations in manures as will, I hope, lead every gentleman here, and hundreds who are absent, to be very cautious in what quarters they buy manures for the improvement of the land. Now in what consists the value of manure? It is quite evident that if manures be of value in the land, if they are useful in eliminating and bringing forth the elements of the crop, and tend to produce luxuriance; the cause is not to be found in every ingredient alike, but some one or two of the many constituents found in the compound article of manure will be the best. You are well aware that the old staple manure was farm-yard dung. Now I have so often spoken of this manure before, that it seems hardly worth while to go over the ground again; but as one expects a lecture to be something like a regular discourse, I must refer to that to begin with. Farm-yard dung is the result of the decomposition of vegetable matter, of materials originally derived from the soil and the air, the vegetables taking one portion of their nutriment from the soil and another portion from the air, and uniting the two by the action of solar light. When these vegetable matters are put into the land, whether they are eaten off by sheep and bullocks, or ploughed into the land, you get a certain result in the land which serves the purpose of manuring; that is to say, in plain English, those substances which once formed vegetable life, re-form vegetable life when they have undergone sufficient decomposition. Now, this being the case, we must enquire which of those constituents that are found in these manures and crops are the most valuable. I need not tell you that the value of a thing depends on the difficulty of obtaining it. If diamonds were found scattered about the road, their value would be no greater than that of flint or granite. It is the difficulty of obtaining them which raises their value to such a large amount. Now, you have in farm-yard dung a large amount of water. The common dung which is put upon the farm, and which is so highly prized by the farmer, contains 70, 80, and, in some cases, 90 per cent. of water. It is quite evident that as the heaven's air is continually furnishing us with a large amount of water in the shape of rain and dew, this constituent ought not to be regarded as very valuable in manure. The truth is, it is just the contrary. The more wet manure is, the less valuable it is. Well, to go a little further, what is the next ingredient? We must take next the carbonaceous matters, or mere woody matters. These are absolutely required when you are proceeding on a large scale; and in putting on twenty or thirty loads of dung per acre, you put on a sufficiently large amount of these carbonaceous substances to be of telling value in the field. In so doing you act quite correctly; but when you put 3-cwt. of guano against fifteen or twenty loads of farm-yard dung, there must be something more to which the guano owes its effect than the mere carbonaceous materials. It is not those alone which do you service; for the amount contained in guano is very small. One ton of guano contains 8 or 9 cwt. of carbonaceous materials. These cannot be the great material of manures; and although it may be useful to put this on the land, either by ploughing it in or by applying it, as we do, in the shape of straw, yet I cannot set any great value on this alone—it is so much saw-dust; and the putting of a large quantity of decomposed saw-dust on the land would produce similar effects to the application of this similar woody substance. When I speak of the application of carbonaceous materials, I do not mean charred materials; because in that case a change takes place, and the matter acquires other properties. To mere organic or woody matters, then, I say, we cannot properly attach any considerable value. Again, there is common salt found in farm-yard dung. We may, perhaps, find half or one per cent. of common salt; but that is too small a proportion to be highly valued. I might go through various other ingredients; but if I did so it would all resolve itself into this—that it is the ammonia and the phosphate of lime, or bone-earth, that constitute the chief value of artificial manures. We shall find very easily, by a little consideration, that with certain limitations, in proportion to the amount of phosphate of lime and of ammonia contained in artificial manures is the value of those manures. Now, in farm-yard dung, as far as I am able to judge—and I have been corroborated by many others—there is seldom one per cent. of ammonia. In the case of the dung of animals which have been highly fed, you may get a little more; and hence it is that you require to put so large an amount of such unconcentrated manure on the land. There are other manures which contain a much larger proportion; for example, guano, various kinds of night-soils, and urines. Now Professor Way, in the "Journal of the Royal Agricultural Society," gives seventeen per cent. of ammonia as the result of his analysis of a great number of samples. I have analyzed a great number of specimens, and I cannot say that all mine have come up to that. A few of them may have done so, but that was by no means the general result. The samples which I have analyzed have not come direct from the ship, and many causes may have led to deterioration. But be this as it may, I have found fourteen or fifteen per cent to represent the ammonia in the guanos which have principally come under my notice. Well, now, ordinary Peruvian guano has likewise from eighteen to twenty-two per cent. of phosphate of lime. Phosphate of lime is exceedingly valuable. It is, as you all know, in the shape of superphosphate of lime, one of the best materials for the turnip crop. It is well known by analysis that the turnip contains a considerable amount of phosphate of lime. When turnips have been put upon the land without the application of phosphate of lime, they have grown scarcely to the size of a radish; whereas the application of a sufficient quantity of that substance has led to a crop of from twenty to thirty tons per acre. It is on the presence of ammonia and phosphate of lime that the value of manure principally depends; and when we know the quantity of those articles which exist in any given case, we shall be capable of estimating tolerably well the value of the manure. You may reckon the price of ammonia in guano and other substances, at 6d. per lb. Professor Way, and other chemists, have shown that 6d. per lb. will represent the value of ammonia; so that if you only have an analysis of guano, and divide the number of pounds of ammonia per ton by 2, you will get the price in shillings; and you will thus obtain the actual value of the ammonia. Now, the value of phosphate of lime may be stated at about 0¾d. per lb.; it may in some cases be a little more; but, if any person should buy phosphate of lime at about 0¾d. per lb., he would, I think, be doing pretty well. Now, take the other constituents of guano. It is very easy likewise to ascertain their value. We all know what is the price of salt in the market. If, then, we find that a certain manure contains four per cent. of salt, it is very easy for us to calculate its value. It cannot be necessary that I should dwell upon this point. Sulphuric acid also is contained in guano, and other manures. It is easy to calculate the value of that. We must not, however, take the price of the highest compounds when we would estimate its value, but take some substance containing sulphuric acid—as sulphate of lime or gypsum, which has a low price in the market. Gypsum is from 20s. to 28s. per ton; so that the small quantity of sulphuric acid in guano cannot be of great value. Without the slightest difficulty, we can therefore form a tolerably accurate estimate for commercial purposes of any ordinary manure. I do not say absolutely accurate, but sufficiently so for the purpose required, the composition being known; for, of course, without such knowledge it is impossible to tell the value. Now, before I leave guano I will just mention its origin and sources. Guano is obtained from the deposits of the dung of birds which have fed upon fish. It is not confined to any one quarter of the globe; it is not confined to South America, but is found in all latitudes where great flocks of birds congregate and deposit their fæces, and where the rain and wind do not carry these away. In many places this manure is now being collected by hand. Instead of allowing it to be deposited for a number of years, parties are actually collecting it, year by year; and it is now being deposited in many islands to a sufficient extent to render this process of collection very profitable: the newly-deposited guano is found to contain, in some instances, 20 per cent. of ammonia. As regards the deposits found in the island of Chinca, and on other islands on the coast of Peru and Bolivia, these have been deposited for ages. Hundreds of years ago guano was used in Peru in the cultivation of the soil; and it has always secured, accordingly, good crops. Guano is then merely the fecal matter of birds. Now this natural substance must evidently vary considerably in its composition. Where there has been little or no rain, there you have it in a state of purity; but on the islands either north or south of the dry latitudes it is found more or less washed with water; the soluble materials are lessened in amount, the ammoniacal salts to a great extent washed away, and the proportion of insoluble materials is increased. This is evident in the case of the Saldanha Bay guano. In that case instead of 14 or 16 per cent. of ammonia you have 1½ or 2 per cent., and 50 to 60 per cent. of phosphate of lime, a substance not very soluble in water. It is, then, quite clear that guano from different quarters of the globe differs very much according to the circumstances to which it may have been exposed. Even guanos from the same island will differ in quality. Those which have been most exposed will be diminished in value as compared with those which have been covered up and not subjected to atmospheric action. Those which have been exposed to the spray of the sea, even where there is little or no rain, will also be deteriorated. But then again, even supposing there were no rain in the latitudes where guano is found, still the vessel in which it is imported may be leaky, and the cargo may become wet during the voyage; and thus the guano may be damaged before it reaches the importer. Gentlemen who are about to purchase guano ought to make some inquiries about the ship in which it has been brought over, or at least to take some steps to secure themselves against losing by the transaction. Ammonia and the other soluble compounds of nitrogen act on plants in a very similar manner. They produce a very great luxuriance of growth, and therefore require to be used with prudence and judgment, especially for corn crops. Many farmers have suffered great loss from the use of too large quantities of guano, or of nitrate of soda, upon wheat and barley, the corn having been lodged before harvest, and the crop in many instances totally lost. With grasses and other plants whose luxurious growth is required, these manures may be used with advantage to a much greater extent, and the increase of weight in the crop will be almost always in proportion to the amount of *nitrogen* in the manure—the land of course being well supplied with mineral ingredients. Kuhlman made some very interesting experiments on grass land, where nitrate of soda, and sulphate and other salts of ammonia were applied in known quantities. The result was, that the increase in the crop in all the cases was in direct proportion to the nitrogen applied—that is, 20lbs. of nitrogen per acre, whether applied as nitrate of soda or as sulphate of ammonia, gave double the increase of 10lbs. of nitrogen per acre. This is an important fact, and advantage should be taken of it for increasing the quantity of green food, and consequently the amount of stock upon our farms. As common salt has a direct tendency to strengthen the straw of our grain crops, it may be very judiciously used with guano and nitrate of soda for that purpose. The chances of the corn lodging are thereby greatly decreased. A mixture of 4 cwt. of salt and from three-quarters to one cwt. of nitrate of soda per acre will be found an excellent spring dressing on light lands for sickly looking young wheat, or for barley. About 2 cwt. of Peruvian guano and 4 cwt. of salt is also an excellent dressing for heavier descriptions of soil. One of the best artificial manures is, I need hardly say, bones. That bones are really beneficial as manures will appear from a very simple consideration. Animals are fed upon vegetables, and the whole of their bodily structure grows out of the food, or is eliminated and formed from it. If that food did not contain phosphate of lime, the bony structure of the body could not be built up: if the land in which vegetables grow did not contain phosphate of lime, the seeds of vegetables could not be matured. Suppose the arable land of this country to have been robbed for a thousand years of phosphate of lime, and never to have received any back again—suppose this article to have been continually exported in the shape of milk, cheese, sheep, and oxen, it is clear that unless the land had almost an illimitable amount of phosphate—which we know is not the case, except in one or two parts of the kingdom—there must have been a proportionate diminution in the quantity of these materials. Hence it is, that when certain substances which had been taken out for a long period had been again suddenly applied, lands which were hardly worth 5s. an acre have sprung up to the value of 15s., and there has been an enormous increase of crop. For a long period, for example, we had been robbing our land of gypsum; but when this material was first brought into use, and applied to the soil, almost miraculous results followed. So, likewise, on the first application of properly ground bones in this country, the effects were quite marvellous. Bones are valuable for two reasons—on account of the phosphate of lime they contain, and on account of the nitrogen which becomes ammonia as the bone decomposes in the soil. Some chemists assert that bones contain 6 per cent. of nitrogen. That has not been the result with all the bones that I have analyzed; probably one-half would be nearer the mark. I may as well mention the adulteration of bones at once. I shall afterwards proceed to speak of guano. Bones are not received by you in their original and entire state, because they would then be of little use to you. As practical farmers you do not possess mills for the purpose of grinding bones, and you are therefore obliged to entrust other persons with the grinding of them, in order that they may be reduced to a proper state for the land. Now it would be well if parties who ground bones ground nothing else; but it does so happen that a great many other things are ground up with them, in order that farmers may buy an adulterated article at a much less apparent price, but in reality at a much greater cost than they could buy a genuine one. I speak this evening from my own personal experience. I assert that the bones ground in London, and in many other places, are often mixed in large quantities with oyster shells. These oyster shells have the property of splitting up into nice fragments, and unless a gentleman takes out his glass and examines curiously with the view of discovering a bit of mother of pearl, he will often not discover that he has bought a fraudulent article. There is frequently from 20 to 25 per cent. of this adulterating material, and of course so long as farmers will patronise dealers without reference to character, and make price the sole consideration in purchasing, so long must they expect to get oyster shells instead of bones. But this is not the only thing which is used for adulteration. Soap-boiler's waste, and sandy and earthy matters, are also introduced. Now, the oyster shell and soap-boiler's waste contain large quantities of carbonate of lime. If, therefore, the farmer makes his own superphosphate of lime, he will experience a double loss, for until all the carbonate of lime has been acted upon by the acid, no superphosphate is formed. Now, as carbonate of lime or chalk takes about its own weight of sulphuric acid to drive off the carbonic acid, it follows that bones adulterated with 25 per cent. of oyster shells or waste, would require five cwt. of extra acid to neutralize the lime before any superphosphate could be formed. Now, there is another manure which has lately come into operation, or at least is being brought prominently before the public—I refer to peat charcoal. We have had a few trials of this material, though not enough to eliminate perfectly all its properties, and to show how far it is available for agricultural improvement. Probably, however, it will prove a very valuable manure, and will be extensively used if it can be supplied at a reasonable rate. This charcoal has, like charcoal generally, a considerable power of absorption. It may be applied to the sewage with good effect, as it arrests the escape of noxious gases. But in the use of it in connexion with night soil, there is one thing especially which would require to be attended to; namely, that some sulphuric acid should be mixed with the charcoal when removed, as otherwise there is a slow escape of the ammonia previously absorbed. This is caused by the gradual action of the air, which replaces the ammonia in the pores of the charcoal, as the watery vapour is driven off. It is very easy to stop this action by means of a certain amount of sulphuric acid. It is difficult to calculate the value of night-soils and urines, because of the great quantity of water contained in them. If you could get them in a dry state, they would perhaps be the most valuable substances in the world; if you could by any means, such as passing the urine through charcoal, get rid of the aqueous material, they would answer well; but it is difficult to do that merely by mixing them with night-soil. From experiments which have been tried it is perfectly clear that a certain quantity of peat charcoal, having urine filtered through it, will, when dried with sulphuric acid, retain 5 per cent. of ammonia, which would constitute it a valuable manure. The experiments are not sufficiently advanced to enable me to say much more on the subject, but there can be no doubt that if this substance is put under our friend Mr. Mechi's sheep or bullock lattice, and if the fecal matter is allowed to pass through the lattice and to fall upon it, such a carbonized manure will be found of great benefit to the agriculturist. I must, indeed, distinguish this carbonized material from mere organic matter which has not the power of absorption. If you took 1 cwt. of straw and carbonized it, it would afterwards have a much greater power of absorption than it had while left in its natural state.

Mr. MECHI: I have used charcoal for that purpose.

Mr. NESBIT: I will now speak of the nature and extent of the adulterations to which guano and other substances are exposed. We have seen clearly that the value of guano and other artificial manures depends pretty much on their ammonia and phosphate of lime; it cannot depend on a given amount of sand or loam, or brick-dust or ground tiles, or any article of that kind which may be mixed with it; and it is a main object of my lecture to bring palpably before any practical farmers here some view, though it must be very inadequate when compared with the reality, of the fearful extent to which adulteration is now carried. I feel perfectly incapable of showing one hundredth part of the actual extent of this evil. Gentlemen, you are robbed systematically. It is not simply that a little country dealer goes and buys his ten tons of guano, mixes some foreign matter with it, and then sells it as genuine—there are men who make hundreds and thousands of tons of materials for adulterating guano, which materials are sold in the market for the express purpose of adulteration. It is a general system, which begins in the metropolis and extends over the whole country. Even the country cheaters are themselves cheated in turn. The men who come to London to buy their manures very often get an adulterated article; the article passes through the hands of half a dozen parties before it reaches the farmer, and when at last it does reach him it is in an extraordinary state of adulteration, very little comparatively of the original matter being found therein. Guano ought not to contain more than 1½ to 2½ per cent. of sand; besides this, there should be 20 per cent. of phosphate of lime, from 14 to 17 per cent. of ammonia, and a considerable quantity of organic matter. Now you can buy guanos in the market containing from 17 per cent, which is a good genuine article down to others containing only a trace of ammonia. It grows—

> "Small by degrees and beautifully less,"

till you have got a thing which contains but little else than our good Essex marl, from the Wanstead Flats or some other place, with a little damaged guano mixed with it to give it the right smell. I have specimens of this kind of guano on the table before me. Genuine guanos are sold in the market in different degrees of purity; they are sold as guano, and as damaged and double damaged; they are known among the trade as D's and double D's. Now would you imagine that the adulterators have the sagacity not to buy the best guano? They never get a fragment of that: they buy the D's and the double D's, and by a proper mixture of these with the materials for adulteration they bring out an article which is sold at nearly the price of the original guano: the D's and DD's themselves fetch a heavy price from their use as giving the adulterated manure its smell. I have lately seen an advertisement for the sale of 1,200 tons of damaged guano, by Gibbs and Co., at an auction mart. I have it on tolerably good authority that the double D's sold at £7 5s., and the D's, or damaged, at about £8 5s., whereas the very best is only from £9 5s. to £9 10s.; and this (the best) does not go into the market mixed with powdered bricks, and so on. There are hundreds of farmers who have used ground tiles or marl with a little double D mixed with it, and then expected to see a good wheat crop in consequence. I said that I had specimens of D's and double D's on the table. Here is a D (exhibiting a specimen); it sells at £8 5s. a ton—that is, after being washed with salt water—which is within about £1 of what the genuine article fetches. Here is a double D (exhibiting another sample), which is supposed to be worth £7 10s., when sold wholesale. Many fraudulent dealers buy the D's or the double D's for the smell, and the guano is preferred to the best article because it is sold at a cheaper rate. They are not even content with selling these as good guano, but they mix them with other more worthless materials; for example, with burnt pantiles in order to give it the beautiful colour of Peruvian guano. The locality from whence that comes is well known in the trade.

Mr. MECHI: Bow.

Mr. NESBIT: They also mix red marl from the Wanstead Flats, in Essex.

The CHAIRMAN: Yes, and they sell it to the flats in Bedfordshire.

Mr. NESBIT: The whole system, in fact, of the adulteration is so well devised that, without analysis, it is almost impossible for the farmer or the ordinary country dealer not to be imposed upon. In some cases it has been known that the buyer has seen his guano taken from the ship's side, and has congratulated himself and believed that he at least was too cunning to be taken in; but, unfortunate man that he was, he had quite overlooked the Essex marl or ground tiles concealed in the barge to be well mixed with his guano as it went up the river to the appointed wharf. Other parties have three or four wharfs for shipment in various parts of the river, and the same adulterated material is often sent even to the same buyer as two or three separate guanos at different prices. Of course those purporting to be different are shipped to the buyer from different wharfs. The two following analyses will give some idea of the adulterations in the manure market:—No. 1, came into the London market, per ship, from Liverpool.—It was offered for sale by sample in some places, as Peruvian guano, at £6 10s. to £7 per ton; in others, as Saldanha Bay guano, containing 60 per cent. phosphate of lime, at £4 to £5 per ton. The samples were contained in bags of blue paper, purporting to come from some ship from Valparaiso. About 150 tons were brought into London, the greater part of which found its way to the farmers of Hampshire, no doubt to their great edification and benefit. No. 2 was offered for sale as Saldanha Bay Guano, at £3 or £4 per ton.

No. 1.—Guano?	
Gypsum	74·05
Phosphate of Lime ..	14·05
Sand..............	2·64
Ammonia..........	0·51
Moisture and loss ..	8·75
	100·00

No. 2.—Saldanha Bay Guano?	
Sand..............	48·61
Phosphate of Lime ..	10·21
Gypsum	5·81
Chalk............	22·73
Moisture	12·44
	100·00

Now I want to exhibit here a few of these samples of counterfeit guano, observing that the way in which they are got up for sale is really very ingenious. I want the opinion of some of the most sagacious gentlemen here as to which of these samples is the best [Mr. Nesbit then handed to the Chariman specimens of two kinds of guano, requesting him to state, after examining them, which he would pronounce the best. The Chairman having selected the one which he conceived to be the best, the lecturer continued.] Well, now, this which our Chairman has selected as the best guano, contains, in fact, a very large proportion of insoluble materials [The lecturer then exhibited in a bottle the proportion of sand to genuine guano in the two samples, shewing that in the guano which the Chairman had considered the best, the sand and other worthless insoluble materials constituted more than one-half of the whole.] In the guano our friend thought the best, there are 264 grains of sand in 500 grains of the substance sold as genuine. The method of mixing in this sample is really good. The sand and damaged guano is not mixed and ground thoroughly together; but the whole is worked so carefully, that the small of the guano is well mixed with the marl, and then the unbroken large lumps of guano are carefully added so as not to break them. The whole, therefore, has very much the appearance of good guano, for the lumps in the mixture are merely the damaged guano unadulterated. There is another specimen (exhibiting it), in which, out of 500 grains, I found 257 of insoluble matter. Let me now shew you the proportion of insoluble matter which is contained in genuine guano. This contains only 9 grains in 500. Remember, gentlemen, in future, that the strongest smelling guano is not always the best. You cannot tell whether or not it is genuine either by the smell or by the colour. In fact, the only means by which you can ascertain is analysis. I will, however, shew you one mode of detection, which will serve your purpose so long as the adulterators continue to act upon the present system. They now adulterate with a heavy article. If you take 500 grains of the best guano and 500 of an adulterated article, and put each into a tube of the same size, you will find the adulterated article much lower in the tube than the genuine one. Here is an illustration [the lecturer here exhibited two tubes, containing respectively the same quantity of adulterated and genuine guanos, the latter reaching far higher in the tube than the former]. The presence of the sand is shown at once by the comparative smallness of the space which it occupies. I intend to bring out a little apparatus for use in the market, one which will enable you, under existing circumstances, to detect adulteration. But I believe this would not long serve the purpose for which it is designed: the adulterators would soon get over that difficulty, by using lighter and more flocculent matter. I must now shew you "THE ARTICLE" itself—the material for adulteration—for it is known in the trade as "THE ARTICLE." You can buy the article in the trade for the purpose of adulteration from 20s. to 60s. per ton. There may perhaps also be 10 or 20 per cent. off for cash. I hold in my hand, gentlemen, 500 grains of *the* article. [The lecturer here exhibited in one tube 500 grains of the article, and in a similar tube 500 grains of genuine guano.] You see the article presents a very sorry appearance by the side of the genuine article. Observe the amount of silica which it contains, and then judge what is the extent of adulteration. I must, if possible, compel the attention of all present to this wholesale system of adulteration. It is not, you see, confined to one or two small houses, but the trade in this article is as regular a branch of business in the metropolis as the trade in guano itself. Possibly there is as much of this adulterated article sold as of the genuine guano from abroad. How does this arise? Whence comes all this adulteration? It is partly owing to the fact of the farmers nibbling and haggling to get the last penny of profit out of the dealer's hands. He has thus been compelling those who would perhaps otherwise be honest to sell an article like that which I have been exhibiting.

A MEMBER: It is the result of free trade.

Mr. NESBIT: This is not buying in the cheapest, but in the dearest market. Let me here observe, that it is quite impossible for persons who have once begun to adulterate to do so to a small extent. No man can adulterate merely to the extent of 10 per cent. It would not pay. In the first place, an article has to be purchased and worked up, and made to look something like guano; then there is the mixing of this article with the guano, which also costs money. The whole process is expensive, and every particle of this expense, in addition to a large profit, must be paid by the farmer who buys the adulterated article instead of the genuine. The probability is, that he does not get in return for his money, more than one-fourth or one third of guano, all the rest is sand, or ground tiles, or loam; the carriage of which is, of course, another item of cost to the farmer. I have often said that if it were possible for chemists to concentrate manures so that they would be worth even £50 a ton, it would be an immense advantage to those who have to use them. Suppose that guano could be concentrated four-fold, it would for that very reason be the most valuable manure the farmer could possibly have; since, being in a small bulk, the cost of carriage would be decreased four-fold. To return, however, from this digression. I was saying that it would not answer a dealer's purpose to adulterate to the extent of 10—I might even say 20—per cent.; nor do dealers confine themselves to such a proportion. These adulterated manures are sold some £5, some £6, some £8 a ton. The least adulterated is adulterated more than 40 per cent.; and in many cases the adulteration is as much as 50 or 60 per cent. It remains for you, gentlemen, to attempt to put a stop to this imposition. I can scarcely offer any other practical means of detection than that which I have just mentioned —that of observing and comparing the different degrees of specific gravity or bulk of the samples. Not being accustomed to chemical operations, of course you cannot be expected to arrive at the truth by means of analysis; but I would advise you under no circumstances to buy manure without an analysis, or from any other than a first-rate party. Let me tell you, too, that even if you do buy of a first-rate party, it is possible you may still be deceived (No, no). My authority is quite correct on that point. I will quote Dr. Anderson's; and the extract will show that even parties who wish to sell a genuine article are often deceived. In an article on guano, in the *Royal Highland Society's Journal*, he says:—"All the risk and uncertainty to which the farming public is now subjected might be avoided, if buyers would give up seeking for cheap guano, buy from dealers of character, and insist on their purchase being guaranteed of the same composition as a sample analysed by some chemist of known accuracy. It must, however, be distinctly understood that all these precautions are necessary, for there are such things as selling guano by fictitious analysis; and I have known instances in which dealers of the utmost respectability, and altogether above the suspicion of fraud, being in the habit of selling guano without analysis, have bought in the same way, and have become the unconscious instruments of introducing a grossly-adulterated article into commerce." I say, then, that even respectable parties may be deceived. There are gentlemen in the trade who would, I believe, scorn either to adulterate or to sell an inferior article as the best; but still even these gentlemen might be deceived. The best way, however, in which you can secure yourselves is by dealing with first-rate men—men who have a character to lose, and who are not, therefore, likely to adulterate. At the same time, I must confess that I see no effectual security except that which consists in your having samples of the bulk you buy analyzed. Look at Scotland. The Scotch farmers have their samples analyzed, and the bulk tested; and they have often recovered damages when the two have not corresponded. Now, other manures are adulterated in similar ways. Nitrate of soda is now mixed with a well-prepared sulphate of magnesia, or Epsom salts, whose crystals are almost undistinguishable by the eye from the crystals of nitrate of soda. Sulphate and other salts of ammonia are also much adulterated. The cost of the analyses of these manures is, however, only a few shillings, so that the farmer ought in no case to receive the bulk of them without having a sample analyzed. There are, in fact, a thousand and one ways of adulterating manures; and you can scarcely ever be sure, under present circumstances, that you are applying to your land a really genuine article. Suppose parties to buy this or that manure. Take super-phosphate of lime. If you don't buy from a genuine house, you will have large mixtures. Fifty per cent., and in some cases 75, of worthless material is mixed with the genuine. I must now mention another matter, which is really so supremely ridiculous, that I hardly know how to mention it. I mean the fertilizing of seeds. Many years ago it was proposed to steep seeds of various kinds in solutions of manure, or to roll them in some manuring powder, which, adhering to the seed, would render good service in quickening its germination and promoting its early growth. There is nothing unreasonable in this, and in many instances some good has been done by the process. But within these few years, both here and in France, parties have come forward to do away altogether with ordinary manuring, and to give such a coating to seed as will carry them well through to harvest. Yes, gentlemen, your boasted farm-yard dung, your Peruvian guano, your superphosphate of lime are now, by the *discoveries of science*, rendered wholly useless! Only put 3lbs. or 4lbs. of a powder over the seed for an acre of land, and you may then, with your hands in your pockets, joyfully await the hundredfold increase of a teeming harvest! Now, in the first place, I as a chemist should condemn the thing at once; and as to you practical men, I should think you must be of the same opinion as the Scotch farmer who, when the laird had remarked to him, "Donald, the time will come soon when we shall be able to carry the manure in our snuff-box," replied "Yes, but when that time comes we shall be able to carry the crop in our waistcoat pocket" (laughter). We have been told that most astonishing results have arrived in France from the use of fertilizing powder on seeds. Having some connections in France, I took the liberty of writing to Mons. Payen, who is one of the professors of chemistry in the Ecole des Arts et Metiers, and who was lately in this country for the purpose of inquiring into the state of our artificial manure manufacturing. In reply to the letter which I wrote to him, that gentleman says:—"The exclusive use of a small quantity of powder or liquid manure to envelop seed would evidently be both dangerous and prejudicial to the true interests of farmer and landlord. I am authorized to add that this is also the opinion of my friend Boussingault and of my other colleagues, the members of the Central and National Society of Agriculture. Besides, the experiments already made in France, and duly controlled by Messrs. Moll and others, were not at all successful. The numerous publications favourable to this ridiculous system of cultivation without manure do not deserve any confidence, for they were paid for by the speculators, and inserted in our gazettes as common advertisements, or publications of chimerical results." So much for the opinion of the French savans; and I apprehend that if it has not answered in France, it will not in England. If, indeed, we could concentrate the virtue of 20 loads of farm-yard dung into one pound, it would be an excellent thing for the cause of agriculture. But now for the analysis of this precious manure, for which I paid at the rate of 20s. for 4½ lbs., or at the moderate and unassuming price of £497 15s. 6½d. per ton! The very first thing which presented itself was 55:59 per cent. of carbonate of lime—or common chalk! I will give you the full analysis.

Composition of a sample of Fertilizing Powder, at the price of 20s. for 4½lbs.

Silica	6·45
Moisture	4·91
Organic matter	25·79
Nitrogen	1·47
Carbonate of lime	55·59
Potash and soda	0·92
Sulphate of lime	1·71
Iron not determined	—
Phosphate of lime	0·96
	97·80

We must all believe that the article is too dear at the price—(laughter). I have letters from various gentlemen, including Professor Calvert, of Manchester, and Professor Anderson, of Edinburgh, all corroborating the fact of the immense adulteration of artificial manures. They have analyzed samples of guano which have been highly adulterated. I have received a letter from Professor Calvert this morning, in which he informed me that he had analyzed some which contained from 70 to 80 per cent. of sand. Now, gentlemen, I have thus brought before you the nature and extent of adulteration. My main object this evening was, that the reality should go forth to the agricultural world. I believe, in fact I know, that there are parties in London who are making their two or three thousand a-year by adulterating manures. The names of these men are scarcely known in the market, but yet that which they manufacture finds its way to the land. It is not such gentlemen as yourselves, who are chiefly exposed to this evil; you take care to protect yourselves; but there are many of the poorer class of farmers, who are continually imposed upon without knowing it, because these gentlemen endeavour to buy 2 tons of guano for £10, instead of being contented with 1 ton at £10. I have placed the matter before you, because I think it ought to go forth to the agricultural world that farmers are being systematically and regularly cheated; that they are imposed upon in this matter; that they are constantly buying sand for guano, and oyster shells for bones; that they are not merely cheated here and there, but that parties make it their business to manufacture THE ARTICLE for no other purpose than that of mixing it with manure. When all this s known, the remedy will lie in your own hands. In the first place you will deal only with men who have a character to lose, men who are stable and who will not risk heir position by anything like deception. In the second place you should not neglect to avail yourselves of the security afforded by analysis. The facilities for obtaining an analysis are much greater than they were, and through the medium of the new arrangements of the Royal Agricultural Society and from different chemists, including myself, it is now very easy to get manures analyzed at a trifling cost, and thus to ascertain whether they are genuine or not. By only spending a guinea on an analysis you might save yourself from losing scores of pounds if you use guano and other manures extensively. I shall now leave the subject in the hands of this meeting, merely observing, in conclusion, that should any new points be raised I shall be happy to afford any explanation in my power (cheers).

Mr. Mechi said he should not presume to address them thus early were it not that, owing to his position as a public agriculturist—an apron-string agriculturist, if they liked the phrase—he was subject to almost daily applications from individuals who had manures to sell, and who tried to obtain his certificate as to their merits. The first thing which he always said to these applicants, who always averred that their manures were the best that were made, was, "Show me your analysis by Professor Way or Mr. Nesbit, or any other eminent chemist, and then I shall be able to come to some conclusion." A few days ago a gentleman from Paris came to him with some powder. He said to him (Mr. Mechi), "What are you planting?" He replied, that he was planting potatoes. The party then said, "I will go down to your farm and manure some of your potatoes; and I am quite sure they will turn out better than the others." He rejoined, "Very well. I am open to a trial; but mind, I shall incur no expense." The party then made arrangements to come down to his farm last week; but for some reason or other he did not carry out his intention. He was convinced that the scheme was absurd; but, however that might be, it was pretty clear that the party must have had a pretty good profit in view; otherwise he would not have contemplated visiting his farm at an expense of 30s. or 40s., in the hope of obtaining his certificate: he must have looked to some one to indemnify him for that outlay. With respect to the adulteration of guano, he had received a letter from a friend at Bow, who said he was shocked at the enormous impositions which were going on under his very nose. There were, he said, manufactories in that vicinity in which were used hundreds and thousands of tons of red sandy clay every year; and farmers were purchasing this article weekly, under the impression that it was guano (Hear, hear). He did not mention names, lest he should be prosecuted for libel; but he must say that to him it appeared astounding that in the middle of the nineteenth century, when there were so many chemists who might be referred to, farmers should be buying as genuine manure what contained 40 or 50 per cent. of sand; and let it be remembered that that was saying, in other words, that they were robbed of from £40 to £50 out of every £100 which they expended (Hear, hear). It was the desire for cheapness which involved so many in such serious loss (Hear, hear). He agreed with Mr. Nesbit that the first security was that of dealing only with men of known character, while the second was that of a chemical analysis. By an analysis he meant an analysis, not of the sample, but of the bulk (Hear, hear), performed before the manure was paid for (Hear, hear). It was well worth the while of farmers to pay for an analysis, seeing how they were constantly robbed. At present they were robbed to an extent which they could scarcely be induced to believe, and which, if they were aware of it, would scarcely allow them to lie down on their beds happily (Hear, hear).

Mr. Cuthbert Johnson said he was quite sure there could be but one opinion with regard to the value of the lecture which they had heard that evening; and he was confident it would do as much practical good as any lecture which he had heard in the course of his limited experience. Mr. Nesbit had suggested that farmers, when they purchased manures, should have them analyzed. In that he cheerfully concurred; and he agreed also that, when they had them analyzed, the analysis should not be confined to the sample, but should apply to the bulk (Hear, hear). He held in his hand a statement of the results of an analysis which was made by Dr. Anderson, a well-known and excellent agricultural chemist at Edinburgh. That gentleman analyzed a patent manure which was sold extensively in the West Riding of Yorkshire. The manufacturers of this manure, who lived somewhere near Leeds, having to contend with the clever, wide-awake farmers of the north, thought it necessary to be provided with an answer to the question put by Mr. Mechi to the gentleman who applied to him—"Where is your analysis?" They, therefore, came prepared with an analysis, which he would lay before the meeting. There could be no doubt that this analysis was, in fact, a fictitious one—that it was made by the fire-side with pen and ink. The manufacturers stated that this manure contained of silica 18·60; Dr. Anderson found that it contained 77·59 (Hear, hear). The manufacturers said that it contained of phosphate of lime 19·55; Dr. Anderson found only a trace of it. He would explain, for the benefit of the unlearned in chemical matters, that by "a trace" chemists meant a quantity so small that it could not be appreciated—a fragment of a grain (laughter). Then the manufacturers held out the delusion that this manure contained of ammoniacal salts 12.25 per cent.; Dr. Anderson ascertained that the quantity was but 10.90. Again: the manufacturers alleged that there was of organic matter, yielding nitrogen, 38.35 per cent.; whereas Dr. Anderson declared that the organic matter amounted to only 1.45 per cent. The whole particulars were set out in the "Transactions of the Highland Society" (1847, p. 24), from which, if he mistook not, Mr. Nesbit had been quoting that evening. It was evident from this statement that they ought to be on their guard against being misled by the word analysis; in other words, they must not take it for granted that every analysis which was put forth indicated what was really contained in the article offered for sale. (Hear, hear.) In this matter, as in every other, much depended on the exercise of common sense. As regarded the article of guano, upon which Mr. Nesbit had dwelt so fully and so well, the real value—the real market price—of that could be tested and ascertained better than that of any other manure. Speaking in a national point of view, he must say it was an unfortunate circumstance that the trade in Peruvian guano was restricted by the Peruvian government to one eminent firm in London; but still such was the fact. Now, that house had but one price; and the price of the best Peruvian guano was, he believed, at that time—and there were persons present who would correct him if he were wrong—£9 5s. per ton. They might then go home with the assurance that if they had bought guano as the best Peruvian at a less price than that which he had mentioned, they had been victimized; it was not to be had for less than £9 5s. per ton; and if any rascally dealer came to them and told them that he would sell them the best Peruvian guano for less than £9 5s. per ton, they might tell him, from him, that he was asserting a falsehood. He had little to add. The subject was one which demanded, and he was sure would receive, serious and undivided attention. Adulteration was not only a source of loss to individuals, but inflicted far worse evils upon the agriculture of the country. One great use of experiments with artificial manures was that they led to the acquisition of sound practical knowledge which might be applied to the general improvement of agriculture. When Mr. Mechi, or any other experimental farmer who was in the habit of favouring the agricultural public with the result of his labours, told them what had been the result, for example, of an application of sulphate of soda in the production of potatoes, he told them what would naturally lead them to expect similar results under similar circumstances; but if, instead of sulphate of soda, farmers applied Derbyshire spar, or bay salt, resembling it in appearance, they were of course disappointed, and were perhaps led to conclude that it was useless to try any more experiments. This was the effect produced upon the minds of honest farmers by the conduct of fraudulent dealers, and he repeated that they could only secure themselves against fraud by dealing with the largest and most eminent persons in the trade, and by, at the same time, resorting to the aid of a first-rate chemist.

Mr. **Purser** (a manure merchant) said no one could regret more than he did the immense extent to which adulteration was now carried, if only because it brought the trade into discredit, and involved even the honest and respectable dealer in suspicion: at the same time he must declare his belief that there were persons in the trade who were quite above resorting to adulteration (Hear, hear). Mr. Nesbit had observed that some parties in the trade might be deceived as to the quality of guano. On that point he must beg entirely to dissent from Mr. Nesbit's opinion. No man who understood his business could possibly be deceived. The house of Messrs. Gibbs and Co., to whom all the Peruvian guano was consigned, stood so much above suspicion, that guano could not be adulterated by them. The dealers—he spoke of the respectable dealers—obtained their supply direct from Messrs. Gibbs, and furnished it direct to their customers; and therefore the notion of its being mixed in the barge was quite a vision of Mr. Nesbit's brain. He had experienced great difficulty in getting farmers to be the medium of exposing adulteration. Even Bedfordshire farmers (laughter) had said to him, "We can get cheaper guano than yours." In such cases his reply had been, "Send me up a sample for Professor Way or Mr. Nesbit to analyze, and I will be at the necessary expense, in order that it may be proved that the article is adulterated." The prevention of the thing would be easy if set about in the right manner. If any party who had sold guano in a market town were once shown to have adulterated it, his character would be so blown upon, if he might use the expression, that he would not dare to show his face again. Guano was not the only thing adulterated; there was adulteration in the case of nitrate of soda. In the previous week he had been shown a circular in which a house in London offered to deliver an article at Camden Town for 10 per cent. less than he could afford to deliver it genuine. The cost price was such that it really did not pay to do business on such terms. There were at that time many persons offering adulterated artificial manure at a price considerably above its value. The adulterating substance costs about 25s. per ton, and it was mixed half and half with guano, and then the whole was sold at a price which made it dearer than the best guano. He repeated, that if purchasers would but send samples to a chemist the evil would soon be stopped; for those who had been detected would not venture to show themselves again. He was in the habit of taking from 1,000 to 1,500 tons a year from Messrs. Gibbs, and payed for it £9 5s. per ton, his profit was about 2½ per cent.

Mr. W. F. **Hobbs** quite agreed with those who thought that the club was very much indebted to Mr. Nesbit for his exposure that evening of the fraudulent transactions of many dealers in manures. There were many persons in the room who had for some time been perfectly aware of the extent to which adulteration was carried, and who had anticipated the advice of his friend Mr. Nesbit, that they should purchase only of the most respectable parties in the trade. He, for one, had done so for the last two years, and in any experiments which he had carried out, the result always showed that he had been supplied with a genuine article. He knew that the same course had been pursued by most of the leading agriculturists of England who purchased guano, superphosphate of lime, and other articles of a similar kind to any considerable extent. The Royal Agricultural Society had thrown out a great boon by allowing Professor Way to analyze for the members of the club at a cheap rate; and the exposure which had been made that evening should convince anyone that he ran great risk of throwing his money away if he bought manure without first having it analzyed. He was rather alarmed when he heard Mr. Nesbit state that even the principal dealers in guano were not to be depended upon, as they, like others, were liable to be deceived; but fortunately, Mr. Purser had contradicted that statement. Perhaps Mr. Nesbit would offer some explanation on the point. They had all heard of rogues in grain, but it would appear that the rogues in manure far surpassed any in the corn market. Mr. Nesbit had told them that there was an article within their reach which might be mixed with the sewage of towns, and then applied with great benefit to the land—Irish peat charcoal. In his own part of the country it might be advantageously used, mixed with fish and other things which abounded on the coast; and he hoped they would all learn to look at home, and make use of the manures which they had, before purchasing from abroad. Peat charcoal might be very extensively applied to agriculture. Much had been said with regard to the blame attaching to the farmers in this matter. He could not admit that they were so much to blame as some supposed they were; for although all this adulteration was undoubtedly a most serious injury, yet, on the other hand, if the market had been less extended, there would have been still more complaints with regard to the effect of monopoly. There was one gentleman present, to whom they were all greatly indebted for breaking up a monopoly which existed a short time since; and, as regarded the farmers, he must say they had throughout been knocked about in a manner which would scarcely admit of their exercising self-defence. He hoped that the hints thrown out that evening by Mr. Nesbit would be acted upon by farmers generally, and that, like himself, they would take care in future to buy only of the best dealers, and to have their manures analyzed.

Mr. **Hughes** said the gentleman who opened the subject had remarked that the farmers had themselves brought about adulteration by their desire to purchase cheap. Now, the motto of free-trade was "Buy cheap and sell dear," and as it was impossible for farmers in the present day to sell dear, they might surely be excused for endeavouring to buy cheap. He could not admit that because they followed the advice of the free-traders, they were chargeable with all the chicanery and bribery of the manure dealers. (Hear, hear.) The onus rested with the fraudulent parties who were guilty of the cheat, and not with those who, like society in general, had sought to protect their own pockets. He did not know whether or not it would be considered irrelevant to the subject to introduce experiments different from those which had been mentioned by Mr. Nesbit. (No, no.) That gentleman had stated, as he believed many other agricultural chemists had done, that superphosphate of lime was generally satisfactory in the case of turnips. He (Mr. Hughes) was a farmer in the eastern division of the county of Kent, and he had perhaps used more artificial manure than any three farmers in that county. He had found the application of guano by far the most successful application for turnips that he had made. The year before last he tried, as it were in opposition, to 4 cwt. of guano the same value of superphosphate of lime, having previously tried bones.

A **Member**: What is your soil?

Mr. **Hughes** continued: The green sand formation. His farm was in the neighbourhood of Hythe, in the parish of Lynn. As the bones did no good, he supposed that they had not decomposed quickly enough, and that scientific gentlemen would tell him that all the good was to come. However, as regarded the turnip crop, the application was a total failure to him. He then purchased some superphosphate of lime and applied it to the land, and he afterwards found, contrary to what he had been led to expect, that, instead of doing good in the same degree as guano, it did, in fact, very little good—that its practical value was far less than that of guano. He might be told that the one manure was adulterated, and the other genuine. Such might be the case; but the result was, that upon the upper green sand formation. where the plough would touch the roots at every 10 or 15 rods, a comparison of the result of applying 4 cwt. of guano, and 6½ cwt. of superphosphate of lime, was entirely in favour of guano. The one crop was decidedly superior to the other.

Mr. Mechi said his experience was the very reverse of what had been stated.

Mr. Nesbit then replied. He said in doing so he would first refer to the steeping of seeds, and to the way in which the parties proceeded. He had at home a copy of the *Journal des Debats*, which contained an account of an investigation on the subject by the Agricultural Society of the Seine Inferieure. A person there brought out a manure, the quality of which was described to be so extraordinary, that 16 quarts of it mixed with the seed was enough for an acre of wheat, and it would do for any other crop. The agricultural society of the department immediately took the matter up, and referred to a chemist, whose report to the society was published in the public journals of France, and he thought our societies ought to adopt a similar course with respect to adulterated manures. The parties concerned got a very severe dressing. It turned out that what they had been asking ten francs for, as manure for an acre of land, was not worth 6d., and the consequence was that no one afterwards used it. The French Government, going beyond the society which he had mentioned, had sent a person to England with instructions to visit different parts of the country, and prepare a report on the artificial manures, in order that they might be *au fait* at every thing that was going on in England in connection with artificial manuring. It was by such means, and especially by the publication of analyses, that we ought to endeavour to put a stop to adulteration. Mr. Purser had commented on a remark of his, that even dealers were liable to be cheated. When he spoke of dealers he spoke of those who were to be found all over the kingdom, and not of two or three respectable firms, which if they had not chemical knowledge themselves, would take care to obtain the benefit of it for their own security against fraud. He spoke generally, and he maintained that his remark was generally correct. He repeated that manure merchants were liable to be cheated, as well as those to whom they sold their manures. Suppose a country dealer to go into the market and see an article offered as the best Peruvian guano at £9 10s. per ton. How was he to tell whether or not it was genuine? No dealer could tell the quality of a manure by a mere touch or look; and therefore without the protection of a chemical analysis the majority of the farmers would continue to be cheated, and the majority of the manure-dealers continue to aid in cheating them. Mr. Hughes had observed that farmers were justified in imitating the free-traders by buying in the cheapest market. That he admitted; but he would like to know whether it was buying in the cheapest market to pay for 50 or 60 tons of sand as guano? (Hear, hear.) Everything which he had said on the subject went to shew that parties who acted thus bought in the dearest market, seeing that of every £100 expended they lost £50., Such persons bought not in the cheapest market, but in the dearest one to which they could resort. With respect to the failure of superphosphate of lime on Mr. Hughes's farm, he would observe that having analyzed some hundreds of specimens of soils, he had found the upper and lower green sands to be about the richest in England in phosphate of lime, and he believed that in his (Mr. Hughes's) case ammonia was the very best material for obtaining any crop whatever. On highly cultivated lands, where there were large quantities of ammonia, superphosphate of lime told better than guano itself. One of the worst soils of the lower green sand that he had analyzed still contained one per cent. of phosphate of lime. He had very little to add. It had been his desire to bring before them the facts of the case, not forgetting the position of the honest manure dealer, who was almost beaten out of the market by men who were making two or three thousand a year by adulteration. It was evidently for the advantage of farmers as a body to deal only with the best houses; by so doing they would enable the honest dealer to sell profitably at the lowest price which the case would admit of. They must not confine their attention to Peruvian guano. Other guanos came into the market besides Peruvian; and the fact that others could be bought cheaper than that, raised the question which could only be properly solved by analysis, as to which it was best to purchase. The use of other manures would of course tend to keep down the price of guano. He held in his hand some dried flesh from Buenos Ayres. He need not say that this country had been in the habit of obtaining hides from America; but within the last year the flesh of some hundreds of buffaloes had been spread over the land of England, and it was a question whether that article should not be used more extensively. It was said that Lord Palmerston was endeavouring to get the guano trade thrown open. That would be a great boon to agriculturists; but as it was easy to obtain Essex marl down the river, nothing could remove the necessity for having a chemical analysis.

Mr. Shaw said, that after the reply of Mr. Nesbit, he should only utter two sentences in introducing to their notice a resolution with which he proposed that they should wind up the discussion of the evening. Whatever difference of opinion there might be as to the manner in which guano and other manures were adulterated, there was, he apprehended, no doubt whatever that more or less manures were adulterated, and that they were deeply indebted to those who endeavoured to point out the sort of adulteration and the means whereby it might be averted (Hear, hear). He might further be permitted to say that on no occasion within his recollection had they had a discussion in which the growing advantage of the application of science to practical agriculture had been more manifestly displayed than it had been that evening. A lecture or discussion on science never came home so closely to men's minds and intelligence as when it was illustrated by those practical matters which came under their daily observation. When science was used to show them the difference between an adulterated and an unadulterated manure, its advantage to agriculture was strikingly illustrated. He would now propose the following resolution:—"That the systematic adulteration of guano and other artificial manures, exposed by Mr. Nesbit, is pregnant with serious consequences to the agriculturist, and that the most effective means of avoiding the evil appears to be a due regard to the character of the dealer for integrity, and more especially the obtaining an analysis by an accredited agricultural chemist of a sample from the bulk purchased."

Mr. Mechi seconded the resolution, which was carried unanimously.

On the motion of Mr. Mechi, seconded by Mr. Hughes, a vote of thanks was given to Mr. Nesbit for his lecture, and on the motion of Mr. Nesbit, a vote of thanks was also given to the Chairman.

This terminated the proceedings of the evening.

LIFE IN A SALADERO.

Whence come the thirty-five thousand tons of ox-hides annually imported into this country?—whence a large proportion of the seventy thousand tons of tallow?—whence the twenty thousand tons of dry bones (for sugar-refining, ornamental turnery, and fancy articles)?—whence the millions of horns?—whence do the great slave populations of Brazil, Bahia, Pernambuco, and Cuba, obtain the dry and salted beef which is their staple food?

The answer to these questions is a description of a South American "Saladero."

Thousands of miles of the finest pasturage in the world are spead over the Pampas or Plains of Southern America; and upon them browse, nearly in a wild state, innumerable oxen and cows, which are dexterously caught by means of the lasso; are brought within the precincts of an "Estancia" (described in former numbers of this work), and thence transferred to the "Saladero" to be killed, skinned, dissected, salted, and distributed to every commercial quarter of the globe.

A "Saladero" signifies, literally, a salting-place, from the Spanish word *sal*, salt. The chief establishments of this nature are situated on both banks of the River Plate, near the two capitals, Buenos Ayres and Monte Video. Trade and manufacture are, however, banished from the neighbourhood of the latter town, by the prolonged siege, which, emulating that of Troy, has been carried on since 1843; and commercial, and every other sort of peaceful activity, has been removed to the Southernmost province of Brazil, Rio Grande da Sul. But the Saladeros of Buenos Ayres, not having been disturbed by warfare, are the only ones in regular and constant operation. They number about twenty-four. Most of them are situated on both sides of a small river, called Riachuelo de Barracas, at a distance of about three miles from the city of Buenos Ayres. Around them a little town has sprung up, and is gaining fresh inhabitants every day, from the increasing business of the Saladeros.

The particular establishment which I inspected was that belonging to the Spanish house of Santamaria, Llambi and Cambaceres; which is situated on a piece of ground that may have a length of four hundred yards and a breadth of nearly two hundred and fifty yards. Its form is quadrangular, having the river on one of the longer sides. On the other three sides it is enclosed by a ditch, or *sanja*, through which the blood of the slaughtered cattle is discharged into the river. In the middle of the square stands a white flat-roofed house, with a small garden and separate yard. This serves as the residence of the *major-domo*, or manager of the whole establishment, and for counting-houses.

Entering through a gateway from the road on the south, the visitor finds himself in a large yard, surrounded on three sides by buildings. On the left is the *corral*. This is a wide but oblong inclosure, with a separate portal from the road, for the cattle to enter at. Within is a smaller *corral* or *vreté*, entirely round, and paved with wood. These inclosures are formed by closely-wedged fences of the trunks of poplar trees. From the month of November to April the great corral is always full of bellowing fat cattle, which is brought, with great trouble and often great loss, by people called *accarreadores*, or *receros*, from the Estancias in the interior. They drive the cattle, either on their own account, or on account of the house of Santamaria and Co., at the rate of from nine to fifteen miles a day.

Let us suppose a herd to have arrived; and, in order to get a clear idea of the life and activity going on in these Saladeros, follow the victims to their doom. Imagine them collected in the great corral preparing to be driven into the small one. The entrance to this is approached by a narrow lane, consisting of two rows of enormous stakes—whole trunks of trees in fact—driven into the earth. The gate between the great corral and the main road is closed. The *receros* are pushing, and goading, and hallooing with might and main, till the beasts are wedged together as tightly as people at the pit-door of a theatre on the night of a popular play; but, unlike the pit entrance, the door of the *vreté*, or smaller enclosure, is of the portcullis kind; and when the performances inside are to commence, it is lifted up. The bovine victims rush in; but the moment they enter, they encounter sights and smells portentous of their coming fate, which impel them to make a sudden retreat. Alas! the instant the last tail has passed under the opening, down falls the door to oppose all egress; and the unhappy oxen finds themselves as completely imprisoned as rats in a trap.

It is three o'clock in the morning of a South American summer, and a bell has already summoned the workmen to their various avocations. Several jolly figures appear, joking with each other, and smoking their paper cigars. Though so merry, they are sanguinary-looking fellows; their calico shirts, their *canzonzillas* or wide trowsers, the *chiripá* or apron, the sash which confines all these round the waist, and the handkerchief which is folded tightly round their heads, are blood-stained. Into the sash is stuck, on one side, a couple of long knives, kept in formidable order by a steel suspended from the other; such being the characteristic dress and appliances of the *desolladcres* or skinners. They all make towards a large floor paved with wood, and sheltered under a roof which is supported by huge wooden pillars. This is the *playa* or butcher-house. At one corner of this playa is a communication with the *vreté*, a sort of doorway, across which is fastened, midway into each post, a great bar. Upon this bar is fitted a small wheel, over the circumference of which is rove a strong and long rope of hide, with a lasso, or running noose, at one end in the *vreté*, and a couple of horses attached to the other end, in the *galpon*. Under the bar is a low carriage, into which the beast falls, when dead, to be drawn away. Sharpening their knives and arranging their implements, the executioners are soon ready for action.

Meanwhile the *Capataz de los Coralles* (Captain of the Corrals) with a half-dozen boys, are busy riding round the larger enclosure on horseback, making the most hideous noises their lungs are capable of, and galloping about in all directions, till they have frightened from eighty to a hundred of the beasts into the lesser inclosure. When that is done, the cattle are shut in, and fall under the knife of the slaughterman by a very ingenious process. Near to the bar and wheel an *enlassador*, or lasso-thrower, stands upon a railed platform—(a short gallery, in fact)—and with unerring aim throws the noose of his lasso over the horns of the nearest animal, and catches it. He then gives the word "dele!" (go on), to the horses harnessed to the other end of the lasso; they move rapidly on, the lasso travels round the wheel till the ox's head is pressed so tightly against it that he is powerless, and forced into a position most convenient to be slaughtered. The *enlassador* then draws from his belt a short dagger, and stabs the animal in the back of the neck—its most vulnerable part—just between the skull and the spine. Death is instantaneous: after a convulsive shudder the beast drops down as if struck with lightning. This is a comparatively humane mode of slaughter, which might with advantage be adopted in this country.

In a minute the car upon four wheels which receives the animal is drawn (on the bar being lifted) into the interior of the *galpon*, on a tram. The carcase is delivered over to the skinners, and the car returns to the fatal bar and wheel for another victim. This goes on all day, with the exception of a half-hour's rest, till three or four in the afternoon; and so dexterously and rapidly is this sort of battue kept up, that during the twelve hours from four to five hundred animals are daily disposed of.

The *desollador* now proceeds to dissection. He cuts the head off in a trice. The skin is disengaged from the trunk by a series of rapid and even cuts, and then stripped. Beef is the next consideration; but only the fore part of the beast is prepared for the salting process. The skinner takes out the two shoulder pieces, the two back pieces, and two breast pieces; so that only six joints are thought worthy of preservation. The carcase is drawn away, and makes room for another animal just slaughtered, to be dealt with in like manner.

The meat having been washed, dried, and removed from the bones, is taken to another place, which is the "Saladero" proper, or salting-house. It has been cut into pieces, which are now arranged in a square pile, each layer being covered with salt. This *pila* containing the results, in beef, of the day's slaughter is afterwards removed to be dried again, and is then ready for exportation. When there is a great demand for beef the drying is done by a forced process, in three or four days; but it is best done when the piles are allowed to remain for several weeks, before dried.

While the meat is being salted and piled, the bones, fat, and intestines are hurried to another part of the yard, where two tall chimneys indicate to us where the *fabrica*, or melting-house, is situated—just opposite to the *galpon*, and forming one side of the square we have just crossed. We pass under its roof—for, like none of the other sheds, it has walls—and observe two fire-places, each surmounted by an enormous boiler. From these boilers ascend four copper tubes, through each of which is driven with the force of an engine, a powerful jet of steam into the bottom of a *tina*, or vat, from fourteen to eighteen feet high, and made of thick pine staves, bound together with hoops. Each steam pipe leads to a separate vat (of which there are eight), either capable of containing from a hundred to a hundred and fifty carcases and heads. It takes several hours "to load" each vat; but when that operation is completed, the steam is turned on, and the whole is steamed incessantly from forty-eight to seventy-two hours. The cleaned and whitened bones are, at the end of that time, taken out and the tallow drawn off, purified in flat vessels and packed in barrels for shipment. The remaining mass is so completely reduced to dry fibre, that it makes excellent fuel, and is used to heat and stew succeeding "loads." This is a great advantage in a district very scantily supplied with wood, and in which there is no coal whatever. The peculiar fuel thus supplied is appropriately called *carne cozida,* "boiled beef." In a Saladero nothing is ever lost, and the utility of *carne cozida* is not confined to "keeping the pot boiling." It is left in such abundance in the vats, that after the furnaces are supplied with it, the rest is heaped up in immense piles; and such as does not find a market in Buenos Ayres is set light to and left to burn till it is reduced to ashes. These ashes are used in road-making; for stones, as well as wood, are scarce on this bank of the river, and successive strata of this ash have so raised the banks of the stream that they protect the Saladeros from inundation.

The most important and profitable part of the ox is its hide. There are two ways in which hides are prepared for exportation: they are either salted or dried. While the meat is carried from the *playa* to the salting house, and the carcass to the *fabrica,* the skin is delivered over to a set of workmen called *descarnadores* or trimmers. They lay each hide on the flat of their left hands, scrape off all the beef and fat which may be adhering to the inner coating with a knife in the right hand, trim the edges, and then stretch out the hides by means of stakes driven into the ground, if the skins are to be dried. If they are to be salted, a pile is made of them with layers of salt. Dried hides require much more time and skill than when they are only salted. In the latter case, they are packed in casks for exportation; in the former, when shipped, they are tied up in bundles.

It is thus that the principal parts of the beast are disposed of; but he yields certain minor articles of merchandise which, in the aggregate, materially increase the trade of a Saladero. The heads are detained on their way to the *fabrica* by boys whose business it is to take the tongues out. When this is done, the tongues are salted, a process which requires great skill, that the salt may penetrate the thick part as well as the tip. In order that the roots may receive the salt more readily, they are hammered on a stone.

But before the head is tossed into the vat, it has to be denuded of its horns, which are to be brought off with the frontal bone which holds them. A few days' exposure to the air, especially in wet weather, so loosens the horns that they are removed with very little effort. Millions of them are exported every year.

The refuse, left behind by the *descarnadores,* is employed in glue-making. Even the tails of oxen are made into merchandise. When sufficiently dry they are packed up in *bales;* but whether their ultimate destiny be soup or not, we have not been able to learn. Certain it is, that from the hoofs is extracted, in a special department of the Saladero, an oil, which pays remarkably well.

The work-people are paid wages which would astonish the European operative. Even boys gain from four to five shillings a-day; while the more skilful workmen can net as much as from six to seven pounds sterling per week.

The control and business arrangements of these great establishments are confided to a foreman, or *major-domo,* who resides on the spot. Under him is a *capataz,* or overseer, for each department. These are almost always foreigners of good family. Indeed, the foreigners abound in all situations: foreigners, especially Basques and Irish, increase daily. The native workmen have been much improved in manners and intelligence by the intruders, and all work in harmony in the Saladero; though the general character of the native population is turbulent in the extreme.

Nearly all the fine territories in that part of the world are periodically plunged in fierce and ruinous war, which retards civilization, and renders commerce uncertain and hazardous. It is to be hoped, however, that with increasing intercourse with Europe, the people of South America will be convinced of the benefits of commerce, which ever brings in its train those industrious habits and moral advantages which war has hitherto banished from the best districts.—Dickens's Household Words.

MR. BLACKHALL'S PROCESS OF BREAKING DOWN BONES FOR MANURE.

We were among the first to notice the process of breaking down the structure of bones by steam. We then stated that though the process was ingenious and effectual, as regarded its thorough division of the bones mechanically, and so far was better for the immediate wants of plants than bones as ordinarily used, still it was not a process which would ever supersede the vitriolising of the bones by acid. For how useful soever it might be to divide the proximate elements of the bones in a very minute degree, it would not at all effect the same object as the latter, viz., the rendering *free* the phosphoric acid which was otherwise locked up in the bones as phosphate of lime—nay, which would still be phosphate of lime, and so chemically locked up, whatever might be the state of its mechanical division.

It is no secret that half-inch bones are more rapid in their action than bones in their rough state. We well remember a spirited agriculturist who applied them whole, to land absolutely calculated for bones, so long as thirty years ago, and he saw no immediate benefit from the application; and yet the soil was eminently calculated for bones, and now, broken to half-inch, produce on the same soil abundant crops of turnips. His general knowledge was far beyond his age, but he failed in his details; and so annoyed and vexed was he, that he hired women to gather off the bones he had so expensively applied. Had he waited, years might have so broken down their structure as to show a decided benefit; and hence, as all bones must be decomposed, partly by the action of oxygen, and partly by the organic power possessed by the roots of plants, which will insert themselves in the smallest crannies of the softer parts of the bones, so a mechanical breaking of the bones will present a larger surface to the action of the air and roots, and so hasten the decomposition of the bones. But even half-inch bones will remain a very long period in the earth undecomposed. We well remember an experiment we tried with half-inch bones, picked off a field which had grown turnips manured with bones four, eight, and sixteen years before, and we grew with these a sample of turnips as good and a quantity as great as did an equal application of bones fresh from the mill. This shows that some bones at least remain long in the soil.

A step in advance of this is making what is truly called bone-dust, *i. e.*, bones crushed to powder. This is an extemporaneous manure, and for the immediate crop is always very valuable—an object generally a primary one in light turnip soils, where that root is consumed on the land. But some have gone so far as to burn the bones, drive off the whole of the organic matter, and so admit of the crushing of the residue into a fine powder; and we have instances recorded, on good authority, where they have been equally efficacious with the raw bones. Hence the mineral theorists jumped at the conclusion that it was solely owing to the phosphate of lime that the bones were fertilising, and this has been dinned in our ears *ad nauseam*; but against it is the stunning fact, that the liquor from boiled bones is also a capital manure! As much as a difference, if we remember right, of upwards of a ton of hay per acre, was produced by an application of two hundred gallons of the mixture, by Mr. Fleming, of Barochan. The real truth, however, is that soils requiring phosphoric acid and plentiful in ammonia, are benefited by the burned bones as much as by the rain; while on the converse, soils with a sufficient supply of phosphoric acid and deficient in nitrogenous compounds, will be more benefited by an application of bones in their natural state. We will attempt to give the analyses, from the best sources we can, of the raw bones and the burned bones. Something like a mean of the analyses of the former will be—

Water and fat	15 per cent.
Gelatine	27 ,,
Lime and magnesia	28 ,,
Phosphoric acid	26 ,,

The burned bones having had the water, the fat, and the gelatine driven off, will thus be described:

Phosphoric acid	43 per cent.
Lime and magnesia	46 ,,
Carbonate of lime	8 ,,
Soda and common salt	3 ,,
	100

So that not only is there, by the application of burned bones, a difference of some sixty-five per cent. of phosphoric acid, which of course is very material in land plentiful in other fertilising elements but deficient in this, but also more of chlorine and soda.

Of the fermentation of bones, recommended by Mr. Pusey, we have little to say. We have tried it over and over in the north of England, and we have always lost money by it. Nor does that gentleman, in his recent review of agriculture and its progress for the last eight years, adduce many instances of any very decided success attending the process. If the action of the soil on a fresh half-inch bone be carefully observed, it will be seen that, deposited in an open soil, some inch deep, with sufficient moisture, and within the action of the atmosphere, in a few days a white mould takes possession of the bone, the gelatinous matter is being decomposed, ammonia is being evolved; and hence bones always push away the young plants of turnips—a very important affair in the production of that invaluable crop. Now, in fermented bones this process does not take place—it has been anticipated; and though some of the ammoniacal matter may be retained in the soil with which they are mixed, the former is decidedly better, as far as our experience goes. But in soils where the phosphates *only* were required, some fermentation might answer.

The cooking of food for animals is well understood. In order to enable them to assimilate their food, the process of digestion is assisted by a partial decomposition of the food; and hence, less vital power being required to extract from it the nutritive principles, it becomes much more easily available for their use. So with plants. Their food may become so locked up by chemical as to resist vital affinity to the very destruction of the energy of the plants, so that a fallow is requisite to disintegrate and liberate the necessary constituents. On the other hand, our manures may be presented to the plants in a similar manner, so that the life-struggles of the plant are expended in dissolving their food, rather than in having it presented ready cooked, fit for use, and easy of digestion, as it is in the case of sulphated bones. Now, the mixture of sulphuric acid with bones effects these changes: It combines with a part of the lime, and forms gypsum, or sulphate of lime, and thus leaves a portion of the phosphoric acid free, which unites, in a larger proportion, with the remaining part of the lime, and forms bi-phosphate or superphosphate of lime. Hence, not only is a change of absolute substance, and a disorganization of the manure, effected, but it is made to be presented to the plant in a form most easily assimilable, and most calculated for its wants. Now, Mr. Blackhall's process performs only one of these processes. It adds no new substance, and it is not alleged to alter one chemical affinity. Hence its effects are mainly mechanical. But they are not entirely so. The heat and the pressure so break down the cellular and bony processes as to leave the following inorganic compounds—so to speak, these separate proximate principles—at any rate unmixed by any process due to life.

They will be, say—

Water	6·91
Organic matter, fat, gelatine, &c.	26·70
Phosphate of lime	53·74
Sand	4·00
Carbonate of lime	8·65
Alkalies	
	100.00

Now, we apprehend that the phosphate of lime will be much in the same state as it is when bones are burnt—more easily reduced to powder than in merely boiled bones—and hence so far in a fitter state for assimilation and decomposition; but, *chemically,* we do not see how the phosphate is rendered one atom more free; and hence, then, as regards that element, it is kept in the same state as it is in burnt bones—at least, in no better—and is not more easily assimilable by the plants.

As regards the organic matter a very different process will prevail. The organic matter liberated from the cells of the lime will commence a rapid decomposition. Ammonia will be given off, and it will rapidly become a putrid mass, the water present materially assisting the process. And on some soils, it must be admitted, this is what is wanted. The crop may not be in want of phosphorus very rapidly, but it may require organic compounds. The raw bone will give off this too slowly, and hence Mr. Blackhall's process will supply the latter amply, and more slowly give off the phosphorus to the plants.

A recent paper, which was read before the useful Chemico-Agricultural Society of Ulster, and published in its journal, is very interesting, and alludes to a process by which, if necessary, thus strongly fermented, the process will be much impeded, and that is, by drying the results of the process in the air, and by salting the residue. This preserves the animal matter from putrefaction.

Taking the analysis of steam-dissolved bones given above, Mr. Jones informs us that Dr. Voelcker, of Cirencester, has made half inch thus :—

Water	18·12
Organic matter	29·29
Phosphate of lime, with a little magnesia	44·22
Carbonate of lime	6·27
Alkalies	1·49
Sand	1·39
	100·78

On these two analyses, and on the loss and gain of the process, Mr. Jones thus speaks: "From the analysis of salted steamed bones, and of the half-inch bones, it will be seen that the former contained 4·93 per cent. of water less than the latter. This is a gain; but they contained 4·14 per cent. less organic matter. This, however, was a loss. Assuming that the bones employed in my experimental steaming contained the same per centage of water as the half-inch bones, viz., 18·12 per cent., the 25 cwt. would therefore contain 6 cwt. 38 lbs. of water, and 28 cwt. 74 lbs. of dry material; in a ton there would be 3 cwt. 70 lbs. of water, and 16 cwt. 42 lbs. of dried bones. As the steamed bone manure contained 13·19 per cent. of water, the 27 cwt. 14 lbs., consequently, yield 3 cwt. 64 lbs. of water, and 23 cwt. 62 lbs. of dry manure; in a ton there would be 2 cwt. 71 lbs. of water, and 17 cwt. 41 lbs. of dry substance. The loss, thereof, of organic matter, during the process of steaming, was 5 cwt. 12 lbs.; the loss on a ton would be 3 cwt. 63 lbs. I do not think, however, that the loss in organic matter was so great as I have stated, as I suspect the bones would contain a much larger per centage of water than 18·12 per cent., as they were very fresh, and had been exposed to the weather before steaming. In making the above calculations the fractions of a pound have been rejected."

The expense of the bone steaming process Mr. Jones gives at £2 7s. 5d. per ton, including the bones, which he reckons at £2, or 7s. 5d. per ton cost. Mr. Blackhall, however, in the same number, estimates the cost at only 3s. per ton. He makes out the saving to be, over cattle bones crushed, £3 9s. 6d. If this can be sustained, it is a valuable process, and cheaper than crushing. —Gardeners' and Farmers' Journal.

STAINDROP FARMERS' CLUB.

At a late meeting of this club, the Rev. H. C. Lipscombe presided. The subject "On the Advantages or Disadvantages of Ploughing-out Old Grass Land," was introduced by Mr. George Harrison, of Forcett. Mr. Harrison being called upon by the chairman, said—The subject of the advantages of ploughing-out grass land, which I am to introduce to you this evening, offers so wide a field for discussion, and is of such importance to agriculture, that I am afraid you will think my address a poor substitute for the talent and abilities of Mr. Edward Scarth, who I regret has not, in consequence of his professional engagements as one of Her Majesty's assistant drainage commissioners, been able to bring this subject before the members of the Staindrop Farmers' Club. I am, however, anxious that this subject should be calmly and dispassionately discussed, so that our opinions may be the means of drawing the attention of the proprietors of the soil, the land agents, and the occupiers to it. The high price of corn which prevailed during the first 20 years of the present century induced landowners to allow a large breadth of grass land to be brought into cultivation. Acts of parliament were got for the inclosure of commons, which were at once broken up, and are with few exceptions still in tillage in this district. Now, if I could show that this land had been improved by being ploughed up—if I could show that it was more productive at the present moment than it was at the time it was brought into cultivation, then I should make out a clear case in favour of ploughing out grass land. I believe it is quite possible to point out land that has been much improved by being ploughed out, where that land has been properly drained (if wet) and well cultivated, and land may be found which has been returned to grass of much greater value than it was previously; yet I regret to say that the larger portion of land brought into cultivation about that time, is seriously impoverished and worn out. Now, with these facts before the proprietors of the soil, we need not wonder at clauses in agreements prohibiting the ploughing out of grass land, and the cautious way in which the owners of property have given their consent to it; but I think it may be easily shewn how very improperly such land has hitherto been cultivated. On this head, I will make a few remarks. In the first place, by far the greater portion of the land in this district is wet, and the proprietors have allowed it to be ploughed out without having it properly drained, and this great neglect has injured the land to a much greater extent than many persons are aware of. If you examine land in the spring which has been sown with wheat in the autumn, you will observe that every grip and water-furrow is washed to double its depth where there is any descent, and you will also observe, upon close inspection, that the roots of the wheat plants are in a great measure washed bare and the finer particles of the surface soil swept from the ridges, leaving on the surface the grit and small gravel stones, which being the heavier portion are consequently left behind. These repeated washings have materially reduced the thickness of the surface soil; and thus we see that to plough the land to the same depth it formerly used to be ploughed, we have to plough up a considerable portion of the subsoil, which in this district is generally of the very worst nature, being yellow poisonous sand, and clay which (however persons may advocate deep ploughing) can only prove to be injurious. I think I can also show that not only has a large portion of the soil been actually washed away, but that it has been seriously injured in other respects. In every well cultivated field a considerabe degree of fermentation takes place—this fermentation accelerates the decomposition of all vegetable matter contained in the soil, as well as any manure that may be applied to it; now it is this *soluble* portion of vegetable matter upon which plants delight to grow, and upon the supply of which their luxuriant appearance greatly depends. Now it must be evident that wet undrained land must be so repeatedly surcharged with water during the winter months as to extract a large portion of this soluble matter from the soil—washing it away down the furrows and grips, leaving little but the woody fibre of vegetable matter, and an exhausted soil, to bring the crops to maturity. I think that I can also show that the improper method of cropping land has tended greatly to impoverish it. Tenants when making a bargain for their respective holdings have a lease or agreement handed to them, containing, among a number of other clauses, a scheme of husbandry laying down a rule for the future management and cropping of the tillage land. In the east part of this county, land is generally put under what is called a three-course shift—first, fallow; second, wheat; third, oats. This system has been persevered in from time immemorial, and has reduced the land to the lowest producing point. In this neighbourhood a four-course shift prevails. It is first, fallow; second, wheat; third, clover; and fourth, oats. Now on the second or third repetition of this course the clover begins to fail, the land gets what is called clover-sick, rye-grass and other seeds are substituted with no better result, and these have filled the land with quicken (or couch grass) of all denominations. These weeds are still further matured in the oat crop, and when the year of fallow comes the field frequently presents the most wretched appearance of weeds and filth that can be imagined. This appears to me to be the way in which almost all wet and poor lands have been managed, and this has materially contributed to render them almost (according to the present prices of agricultural produce) not worth cultivating. Before stating what method ought to be practised in the cultivation of newly broken-up land, I will just make a few remarks upon the grass land which I think ought or ought not to be converted into tillage. All good grazing land I would keep in grass, and, unless it were to improve the herbage, all grass-land lying in so high a climate as not to be adapted to the growth of corn, whether such land were in a state of nature, or whether it had been formerly in tillage and improperly laid to grass. The land which I should recommend most strongly to be brought into cultivation is land lying in such a climate as to be adapted to the growth of valuable green and white crops, and which, from the improper manner such land has been laid down to grass, is almost worthless to the occupier. Such land generally bears the most unmistakeable evidence of having been in such a state of filth when last in tillage as to drive the plough from the field and to have laid itself away. There is still further reason to believe this to have been the case, for the ridges are lying as they would be ploughed in the last course of the shift (the oat crop), two ridges together, or two inover and two outover; but this is not of so much consequence—such fields generally present what is called a hide-bound appearance, the grass being nothing but couch or quickens, the roots so interwoven through each other as to form a perfect mat, resisting the penetration of water in the wettest seasons on the middle of the ridges, although the furrows may be standing full of water. I say this from experience; for such land upon being ploughed up after the wettest seasons I have found perfectly dry and with a white mouldy appearance. Now all attempts to improve such land while in grass have proved, and must ever prove, fruitless; the quickens keep possession whatever you may do. If you manure, you increase the *bulk* of your crop, but the *quality* is the same. In some fields you will find a portion of land of sweeter and better quality than the rest, which the stock eat into the quick, leaving other portions untouched; and thus when a field of this sort is stinted with as much stock as it ought to carry, you find the stock almost hungering, although portions of the field are full of this unwholesome grass. With such land as this, there can be only one opinion, and that is to plough it up, and instead of allowing such a field to be a dead weight upon the farm, make it the means of improving it. The first thing which I shall point out to be done previous to breaking up such land, is to have it thoroughly drained so that it may be laid perfectly level without either grip or furrow, and afterwards to be ploughed up and sown with oats. In some cases I would take *two* crops of oats, and afterwards I would have it sown with green and white crops alternately and with such variations that the greatest possible number of years shall elapse before you have a recurrence of the same crop. By this system of cropping, and keeping the land perfectly clean and consuming as many of the green crops in the farm-yard as possible, I am quite satisfied in my own mind that such land ought to go on improving. I have made no calculation of the increased value, either to the landlord or tenant, of land thus converted into tillage; such calculations can only be imaginary. Proceeds and expenditure can in all such estimates be made to balance on paper with great nicety, but when brought to practice prove very fallacious. The advantage I consider a tenant would derive by ploughing up a portion of grass land, would, under judicious management, extend over his whole farm. By the increase of green crops his manure would be improved in quality and increased in quantity, by a surplus of which older tillage land would be improved. It might be stipulated that some portion of old tillage land be laid down to grass, which after a thorough drainage would very much improve it, and after lying two or three years to plough it again, and treat some other field in the same way. The advantage to the landlord would be to enable the tenant to make the most of his farm, and to meet the depression which has taken place in the prices of agricultural produce so far as the capabilities of the farm will allow. The advantage to the labourer will be obvious; the draining of land, the stubbing of hedgerows and brushwood, the sowing and securing of crops, would be a never failing source of employment, which would alike be profitable to the employer and the employed. The benefit to the community must be obvious, when by these means you raise the food of man from land which in its present state may be almost denounced as the talent, which we read of in scripture, that was buried in the earth. Now this seems to be the view I take of this important subject, and I may sum up by saying that with proper management grass land may be brought into cultivation with advantage to both landlord and tenant, and by raising an additional supply of the products of the earth to feed the increasing population of this country, afford profitable employment for the British labourer. And, *vice versâ*, where there is a determination on the part of the proprietor of the soil to allow his land to lie undrained, and to be managed under the very worst systems of husbandry, the consequences must be alike ruinous to himself and to his tenants; and the population of this country, so far as he is concerned, must look to the foreigner for the necessaries of life, and the labourers to the improvers of their property for employment, or to the workhouse for relief. Under such circumstances any increase of tillage would not be advisable.

Mr. **Raw** said, the present was a subject upon which he could not be expected to say much; the high situation of his farm rendered it unsuitable for much tillage, and except with a view of improving the quality of the land and herbage when subsequently laid away, there was no great scope on his farm for experiments like those which Mr. Harrison had alluded to, for a great breadth of tillage would not be desirable in such climates. Still, even in such situations, he believed that to plough out some fields for several years, then laying them away in a proper manner to grass, would be a great improvement. In most cases where land was to be laid away again there should be no more than one or two fallows.

Mr. **Hawdon** said, he agreed generally in Mr. Harrison's remarks. He would not do much in ploughing out old grass land in high and precarious climates, except for the purpose of improving an obviously pernicious herbage when laying it away again; nor would he plough out rich pasture land. He would confine his operations to the lands alluded to by Mr. Harrison. Then as to the method of doing it. He would not plough-in the herbage; but with the matty land especially he would pare and burn. There was no necessity for ploughing-in these weeds; for if you could get your land into crop, you could always gain sufficient manure to improve it from year to year. As to cropping it, in new land no formal scheme could be laid down. It must be left to the judgment of the cultivator. Many of the schemes of husbandry current in leases were only fit for shelving in the British Museum.

Mr. **Heaviside** said he would break up all the old tough matted pasture land, and secure the improvement of its herbage, if subsequently it should be laid away; but he would pare and burn and not plough-in the sod. He had tried both plans, and if he might judge by the crops, he had lost £100 in one case, by not adopting the plan of paring and burning, instead of ploughing-in the turf. Whilst on this subject, he would state that, by a judicious improvement of the herbage, by ploughing out and properly laying away again, as well as by other methods, many of the existing moors of the country might be converted into excellent sheep-walks, whilst at present they are kept waste for the purpose of amusement, and for supporting the worthless game-laws which disgrace the statute-book of the land (cheers), and which are amongst the greatest curses to agriculture, and to the morals and welfare of the community at large (loud and continued cheers).

Mr. **Hartas** said he should alternate many kinds of land, keeping it under the plough for several years, and then laying it to grass during as many years as it had been kept in ploughing, and so on again.

Mr. **Bell** said, that even in high climates there was much land which required ploughing out. It was producing a grass which though the stock would perhaps eat, yet it was so devoid of nutritious matter that it did not fatten them. He would plough out this land, take a crop of oats, treat it with guano and other portable manures, and after growing turnips and other green crops, then get a crop of oats or barley, and sow it away with seed of the best and most nutritious grasses for permanent pasture. It would keep three times its original stock for several years after, and he would let it then lie to grass until it had evidently deteriorated in its herbage, when he would then apply to it the same treatment as before. Farmers ought to remember that they did not want a herbage which stock would eat rather than hunger; that would not pay; they wanted a herbage which stock relish, and which fattens them and adds to their weight. There was another description of land that he would plough out, land with a thin soil and a wet bottom. They might see this land in our own and other counties; a field of twenty acres with a horse or two upon it. The burthen of the farm, as to the payment of rents and the maintenance of the farmer, is resting upon other fields. He would begin by draining such land thoroughly; plough it, it needs no paring; take a crop of oats, give it a covering of lime, fallow it again, sow it with wheat, and afterwards lay it away in grass. It was a great pity to see so many fields rendered worthless by want of drainage, and by not being ploughed out and laid to grass upon some proper principle. In both the instances he had mentioned land might be made to enable the farmer to feed good stock and to feed much more of it.

Mr. **Harrison**, in reply, said that, in reference to Mr. Hawdon's observations as to paring and burning, he must say that he had had great experience in ploughing out land, and he had always observed his crops weaker where he had pared and burnt, than where he had ploughed-in the turf. He could not, therefore, agree in the observations as to paring and burning, his experience being decidedly the other way. In reference to ploughing out, much mistake was sometimes made as to the times selected for the purpose. The work should be done, if possible, in August or September, and never later than October. If they ploughed-out in a proper time of the year, they would not need to pare and burn, unless in the case of land full of rushes, whins, and such like things. He had never had a failure by this method; but in a portion of his land of sixty acres, which was pared and burnt, that part was much weaker in crops than where it had been rifted out and ploughed in. He would always do this where possible, unless in the case of new land or grossly uneven surfaces. As to what Mr. Bell had said, it was his opinion that some of the land between that place and Durham was incapable of *great* improvement, though Mr. Bell's plan would certainly be the best that could be adopted. Mr. Heaviside had alluded to the game laws. Without some great alteration in these, unless in cases of very forbearing landlords, the tenant's hopes and confidence in improving his farm were rendered quite futile. It was a most lamentable thing that landlords should persist in cropping their tenant's land with game, and thus depriving him of the fruits of his capital and skill. They not only injured the farmer, but they encouraged poaching, demoralized the community, and, in their enforcement, loaded the poor rates with the maintenance of the wives and families of convicted poachers. It was a shame that the expenses of prosecuting should be defrayed out of the county rates; it would be much fairer and more equitable if the person who prosecuted the poacher had in all cases to pay the cost of prosecution out of his own pocket.

Mr. **Dean**, the secretary, here called the attention of the meeting to one omission in the debate. He alluded to the benefits of liming the land previously to ploughing-in the turf. The lime would form a valuable corrective to the acids in the soil, neutralizing them, and greatly increasing the chances of fertility in the succeeding crops.

Mr. **Harrison** resumed. He asked, why pare and burn? Why not plough in the herbage, which was thus to become useful manure? The American people had given up paring and burning. They would not now set fire even to the long grass. They insist upon ploughing it in, and he thought they were right. In a field of his which he ploughed out, some of the grass was mid-leg deep, and he had the best crops in those parts where he had ploughed in the most grass. In some parts of the farm which he occupied under Mr. Mitchell, where he had pared and burnt, he found the crops weaker. In places where the turf had been cut off at Saltholme for the purpose of sodding embankments, the land thus deprived of its turf would scarcely grow corn at all, whilst in adjacent parts of the same land where the sod had been left and ploughed in, the corn grew luxuriantly. To cut and burn the turf was to act the part of him who killed the goose to get the golden eggs.

Mr. **Bell** said, in a field of 20 acres ploughed out in 1833, which was worth 18s. per acre then, it was pared and burnt, sown with turnips which were ate on it by sheep; then oats were sown; then two wheat crops in succession; after that a fallow; then turnips, and then it was sown with barley and grass seeds. It was greatly improved in value, and all this was pared and burnt.

Mr. **Raw**.—How do you get your long grass covered?

Mr. **Harrison**.—We plough with a wide furrow, and turn it well over.

The thanks of the meeting were then voted to the chairman, and the members dispersed.

READING FARMERS' CLUB.

The subject of "Hedge-Rows and Hedge-Row Timber" was introduced by Mr. Hewitt, of Caversham, and listened to with that attention which the practical knowledge of the speaker and the importance of the matter alike commanded.

Mr. **Hewitt** said that, in these times of low prices, it was now more necessary than ever that the attention of both landlords and tenants be directed to the amount of injury which was sustained by them in the shape of useless hedgerows and hedge-row timber. He did not mean to say that all hedge rows and all timber ought to be grubbed up, but he thought the greater part of both in woodland districts might be well spared with advantage, as the damage they inflicted, where the enclosure was small, was really almost beyond calculation. All crops were more or less injured by the shading of timber, but root crops were much more so than any other; in fact it was impossible to grow roots at all wherever the roots of trees went. He would just endeavour to make an estimate of the damage done upon a seven-acre field shaded and surrounded with large hedge-rows and timber, upon a four-course system. Taking the swede crop at 20 tons per acre as an average upon open fields, in a high state of cultivation, it would be found that, with the same cultivation and manures, 10 tons would be an average upon such fields as he had alluded to: there was a loss of 10 tons at 12s., which would be £6. One quarter of barley at £1 would be a moderate estimate of loss. He would admit that the clover crop would not be much injured, and would let that pass. The wheat would be at least one quarter less, say, at present prices, 40s. It would thus be found that now, at the very moderate estimate, the loss would amount to £9 on the four years. Though this was the truth, yet until very lately farms such as he had described had found tenants to occupy and take them whenever vacant, and while this continued, landlords were not so much to blame as tenants. But very different times had now arrived, and with prices reduced mostly one half, different arrangements must be made, and he thought that the tenants of all such land who had interest upon these, four or more years ago, had a right to ask their landlords either to grub the hedge-rows and timber or reduce the rent; though he doubted whether any amount of reduction would be of service in many cases. He felt quite certain that if landlords had the slightest idea of the actual damage done, they would immediately give leave to grub them all up. His own landlord had done so; and he was beginning to feel the benefit. Trees often did more damage to one crop of swedes than the entire value of the timber. It was not desirable, in his opinion, to grub up all hedge-rows and trees, as on meadows and grazing land they afforded shelter for stock, and did but little damage; and he did not think that on cold days, where the fields are large, so much injury was done, as they afforded shelter from cold winds; but upon the whole they were a great nuisance and seldom of any good, as the root not only robbed the crops of nutriment, but often broke ploughs and harness, tore off the loads of corn in harvest, and did an amount of damage which could not easily be estimated.

Mr. Monck, of Coley Park, said that he thought Mr. Hewitt had estimated the evil of hedge-rows and timber upon too low a scale. He often wondered, in riding across the country south of Reading, when hunting, how such ditches, banks, immense hedges, and timber were ever cut and planted. He could only account for it upon the supposition that, in the old times, people had found it necessary to cut the ditches in order to carry off part of the water, and then planted the large dry banks with the view of getting something, and they afterwards no doubt found a profit in the shape of good oak trees, which sold well for navy timber. But whatever could induce men to cut and curve out, often in so curious a fashion, such immense ditches and banks around only three, four, or five acres, he could not imagine. Certain it was that now, when a better and more scientific system of drainage was known, and had been proved to answer, it would not be long before all these old-fashioned works would disappear. He could not put the loss at less than one-sixth to one-seventh upon seven-acre fields surrounded by hedge-rows and timber, and thought it was a question that solely concerned landlords, as they were the losers in shape of the increased rent which they would receive under an improved system.

Mr. Leach agreed with Mr. Monck as to the reasons which had induced our forefathers to cut such ditches and plant so much timber, as low-lying wet clay lands could not have been cultivated at all without. He had some such land, and had grubbed up all the hedge-rows and timber, and laid it quite open, and that with good draining had effected a very great improvement, and he was satisfied that it would pay him well.

Mr. Hewitt stated an instance where a gentleman was offered £60 for a single oak tree fifty years ago. The same tree was cut and sold last year for £16; and calculating the loss, with interest and compound interest, besides damage done to crops, it would be about £200.

Mr. Turnbull said that, according to his experience, Mr. Hewitt had not estimated the damage done by hedge-rows at more than one-half. In fact, the evil was so great, that it was almost impossible to put it high enough.

Mr. Kidgell said, with reference to Mr. Monck's observation that it was a landlord's question, he could not but differ from him entirely, as it was well known that tenants could only cut such trees as were marked by the landlord or his servants, who were often very ignorant upon the subject. He had found that hedge-row timber was not so hardy as that grown in a coppice, and never brought so much money per foot when sold. This was an argument in favour of growing timber in a proper place, viz., a plantation. He had one row of ash trees on his farm, that did more damage to the crops every year than the entire value of the timber. In his opinion, ash was more injurious than any other sort of timber, as the roots spread so much further.

Mr. Monck said that he had a barley field skirted by a plantation of ash on one side: on that part of the field he kept the barley separate from the rest, and found on thrashing it that it was quite worthless. The rest of the field yielded six quarters of good barley per acre.

Mr. Dickson said that this would ere long be found to be simply a landlord's question; for if there was one fact in agriculture more certain than another, it was the impossibility of tenants continuing to pay rent for land encumbered with hedgerows and timber; and he would say to every man so situated, that unless he immediately got leave to grub, the sooner he gave his landlord notice to quit the better it would be for his pocket: and if tenants would only act generally upon this suggestion, the days of hedge-rows would soon be numbered. It was not to be expected that landlords would voluntarily grub their timber all the while they continued to receive their rents. But it was in this as in many other cases, necessity compelled them to adopt improvements, and the present and prospective low prices would soon be the means of throwing open the face of the country to the mellowing influence of the sun and air, now alike unhappily excluded in many instances. He lately inspected a field of swedes that was represented as being very superior for this season, and found the whole field, which was only six acres, completely surrounded with a large hedge full of elm trees, and upon some three acres in the middle of the field there was certainly a fine crop; but upon all the outsides there was not a root to be seen larger than a common walking-stick. Putting the crop at 20 tons per acre, at 10s. per ton, here was a loss of £30; and if the old saying was true that "roots make muck, and muck makes corn," the £30 was only the beginning of the loss. And when we remember that there are some parts of the country, in Devonshire for instance, which, according to a pamphlet he had lately read, by Mr. Kerr, no less than one-third of whole parishes were entirely covered with hedgerows, it was not easy to estimate the national loss of food by such a system.

After some further discussion, the following resolution was adopted:—"That, in the opinion of this meeting, hedge-rows and hedge-row timber are a serious injury alike to landlords, tenants, farmers, and the community at large; and that, unless speedily removed, all land encumbered with them must necessarily, at present prices, cease to be cultivated at a profit."

PROBUS FARMERS' CLUB.

LECTURE ON FARM LEASES.

Mr. Olver, of Trescow, in St. Mabyn, read his paper on Farm Leases. He said, having been requested by Mr. H. Tresawna, the secretary of the club, to give a lecture on some subject connected with agriculture, he had selected the subject of leases, as being one of the greatest importance to the advancement of agriculture, and in which also the whole community was deeply interested. At the annual meeting of that club, he thought members could not better employ their time than in considering whether, as tenant farmers, they were justified in making on their respective farms the expenditure necessary for carrying out the improvement in which they were engaged; and whether a much larger expenditure might not be advantageously made by the majority of tenant-farmers, provided their leases were such as to justify them in making the outlay. He was of opinion that a greater outlay of capital on land, by landlords and tenants, would lead to their mutual advantage; but that, under existing leases, tenants were not justified in making the required outlay. After some further preliminary remarks, in the course of which Mr. Olver bore testimony to the benefits which the press had conferred on agriculture, he said that he proposed in the paper he was about to read, in the first place to explain, simply and briefly, some of the evils arising from existing farm leases; and then to submit for consideration the outlines of a lease of his own construction, and explain some of its advantages. Leases are of great antiquity; they were granted by the ancient Britons (who possessed more land than they could cultivate or manage profitably) to their slaves, and subsequently to free British subjects. And I believe that many in the nineteenth century contain them entire as transmitted from their earliest history, and fresh clauses have from time to time been added, which are very prejudicial to the prosperity and progress of agriculture.

Leases are made for the purpose of protecting landlords; but the protection they afford them is such as that afforded by an aged oak to shrubs beneath its branches—while it shelters them from an occasional storm, its baneful effects are very perceptible; every plant within its pernicious influence dwindles. And I would ask, what is the state of agriculture in this country, when compared with that of the merchant, the manufacturer, or the mariner? Why dwindling; and its condition would have been worse, had not some farmers had moral courage enough to let their leases remain unheeded on the "shelf." Instead of leases encouraging good farming, they compel persons to farm badly. But when we consider by whom they are made, this is no wonder. Leases generally are made by persons quite ignorant of the principles of agriculture. Can there by any thing more ridiculous than a landlord, probably his steward, and a solicitor (neither of them knowing how to raise the rent of a farm one year), sitting in an office and drawing a plan as to how a tenant is to manage a farm to enable him to pay his rent for fourteen years? Surely practical agriculturists would be the fit persons to be consulted in making leases. But there is no class of persons capable of laying down rules for managing a farm for fourteen years, so that the landlord and tenant may each derive the greatest amount of profit. And it must be remembered that their interests are identified. This brings me to the first remarks I would make on the ill effects of our existing leases.

Leases are invariably made to extend over a certain period, generally from seven to fourteen years. Now any fixed period is a bane to the progress of agriculture, because it takes the first half of the tenant's term to get his land in order. During that time he rarely ever derives any profit from its cultivation; for, in addition to the extra expense he is at in cultivating and manuring the land, his crops are frequently very deficient, in consequence of the land being too much worked for the purpose of cleaning it, so that there becomes a want of solidity, so essential to the growth and perfecting of most of our cultivated crops; and particularly in light soils, which are most favourable to the growth of weeds. The latter part of the term is a period when the tenant's efforts begin to slacken. In order to reimburse himself in the short remaining time, he finds it necessary to discharge some of his labourers, and to employ a less number of working cattle: hence the farm soon falls back to its original state of foulness. But the tenant has another object in letting the farm return again to its former state—namely, that of taking it for another term for some twenty or thirty per cent. less than he would probably have to pay for it, had he kept up its fertility; so the land does not increase in its intrinsic value. Neither has the owner any right to expect it would; and the tenant is labouring one half his time in vain. Under our existing leases, there should be an understanding between landlord and tenant for a fresh term, at least three years prior to the expiration of the first. Then, if the tenant were certain of leaving, he would not have that inducement for racking the land which I have before stated.

Payment of Rent.—Leases invariably give landlords the power to distrain for rent, and to pay themselves before all other creditors. This clause is not only unjust, but is prejudicial to the agricultural interest. In the first place, it is *unjust*, because, in consequence of that clause, landlords are often induced to take tenants who offer the highest rent, without inquiring into their circumstances. When a stranger comes into a neighbourhood, it is reasonable that tradesmen should solicit his favours; and since he is a chosen tenant before others whom they know to be responsible men, they feel themselves justified in supplying him with goods. In case this tenant should become insolvent, in consequence of paying too high a rent for his farm, or for want of sufficient capital to manage it, certainly it would be but just that the landlord should participate in the loss, at *least* in common with his other creditors. Further, this clause is prejudicial to the agricultural interest by depriving it of more capital. "Men of straw," by offering exorbitant rents for farms, and by complying with absurd leases, have been the means of driving capitalists out of agriculture. And why? Because they cannot realize nearly the amount of interest there that they can in any other business; and their energies and independence are fettered. I am acquainted with but few farmers, who commenced business with competency to manage a good farm and educate their family, who are bringing their sons up as farmers; and for this reason—they find that other men, who set out in life about the same time, with the same amount of capital, either professionally or in business of any other kind, have done much better than themselves, and at the same time have enjoyed more of the good things of this life. Surely, then, it may be said that this clause is prejudicial to the agricultural interest, since it deprives it of two things so essential to its prosperity—intelligence and capital. By the joint application of these, land would rapidly increase in value; that which is now dear would become cheap; a greater number of labourers would be employed; and this country would feed its inhabitants.

Grass land not to be broken.—Much land that is laid down for permanent pasture becomes quite unprofitable, which, if cultivated, would produce more beef and mutton than it does at present, and in addition good crops of corn; besides, it would afford employment for the husbandman in his native country, instead of being compelled, as he now is, to seek employment in a foreign clime. Land cultivated to produce good crops of corn should not be laid down for permanent pasture, except under peculiar circumstances, such as pleasure-grounds overshadowed by timber, or in the neighbourhood of large towns. Most leases, that have come under my notice, bind tenants to let their arable land remain a certain number of years in grass after taking a corn crop, and this clause has a very prejudicial effect. The best farmers may sometimes fail in producing good crops of grass, especially clover, in consequence of dry seasons and various other causes; and it is impossible, in some unfavourable seasons, to clean land. Yet the tenant is bound to let it remain a certain time out of tillage, irrespective of its condition, and during that time the land is frequently unprofitable in every sense of the word; for if land is not left out clean with a good floor of grass, it is sure to become full of weeds, which will materially injure the succeeding corn crop. Besides, it will not produce much pasture, or keep much cattle, from whence profit should arise; and the decomposition of plants, with the excrements of cattle, are the life and soul of corn crops. Hence the absurdity of this clause. Tenants should be at liberty to till their farms as they think proper; then under such unfavourable circumstances, they would immediately break up their foul, unproductive land; and let that which is clean remain a longer time in grass. It is a mistake to fancy that tenants would take advantage of this and rack the land. Look at Norfolk and other districts where the arable land is always kept in tillage, for example, and I am persuaded that the principal part of the arable land in this country ought always to be kept in tillage, because it will not produce grass; yet, by the application of artificial manure, it would yield abundant crops of turnips, rape, &c.

Manure, when land is broken up from Grass.—Leases generally in this county bind tenants to lay on every acre of land, indiscriminately, a certain quantity of lime or sand. It matters not what are the principal constituents of the soil, or in what condition it is found. Lime is undoubtedly of great service to some land; nay, indispensable to its profitable cultivation; but vast quantities are annually wasted by applying it to land where, instead of increasing its fertility, it has a contrary effect. It is a mistake to fancy lime is a landlord's manure; that it enriches the soil, or that tenants can enrich themselves, without well manuring the land. Since tenants generally are not capable of analyzing the soil, they should be at liberty to use what manure they think proper. If that was the case, we should not hear them saying (as we now frequently do) that they have never applied any foreign manure but lime or sand; and that they have never proved whether they are of any service or not, because they are bound by their lease to apply that, therefore they cannot afford to purchase any more; but every one would prove what manure was best adapted to his respective soil. Then he would soon discover that the more he applied of it, the greater profit he would derive from its cultivation.

Game.—Leases generally reserve for landlords a right to stock their land with game to any extent, and liberty to destroy it in any way they think proper, without making the tenant any compensation for the damage; while, at the same time, they bind the tenant to pay the rent, tithe, rates, and taxes. Though the landlord has the power to destroy all his crops with game, the tenant dares not touch one of them. I have often thought farmers are the only class of persons that could be induced to submit to such absurdities. If landlords wish to preserve game, there is nothing to prevent them; but certainly they should be answerable to tenants for the damage done to their crops; and if they were to pay only a reasonable amount of damages, they would soon discover game was too costly to preserve to any extent. It is repugnant to common sense for tenants to lay out their money to improve land under such circumstances, and in this country there are thousands of acres of good land left uncultivated for the sake of game, and as much more that is not half cultivated because they would destroy its crop; and landlords lose many spirited, enterprising farmers, for such persons will not take farms near game-preserves at any price, feeling satisfied that disputes would arise between their landlords and themselves, when they must bid adieu to prosperity. The neighbourhood is thereby deprived of good examples, and labourers of good employers; rates and taxes are considerably increased by the game laws, and the means of defraying them curtailed; for be it remembered that while the burdens on an improving farm become light, on one that remains unimproved they become more burdensome, and these unimproved farms increase the general amount of rates, because they do not employ a sufficient number of labourers. I have explained a few of the evils arising from the preservation of game, but what a dark catalogue remains untold! of the innocent blood it has shed; of the murders committed; of the distress and anguish of the fatherless and widows, which is frequently increased by being sent from their once happy home to some union house, or the separation of those who have been long united in the bonds of affection, or the gaols filled with innocent victims—and notice, that in Spalding gaol, at this time, nearly half the prisoners have been committed for offences against the game laws—of the thousands of felons and paupers produced by means of contamination; and last, though not least, the expense of maintaining them in idleness and unprofitable employment, which is a very great hardship on the industrious classes, considering that many a poor wdiow is called on to "cast in her mite," while rich men pass free. What can be the object in preserving game? Can it be profit? That never can be, since it costs ten times more than it is worth. Can it be pleasure? Surely it cannot be; for what pleasure can there be in killing a hundred hares, or fifty brace of pheasants in one day?—a feat often boasted of in newspapers, but I always consider it a disgrace to the butcher. I have always felt the greatest pleasure in pursuing. I was never much of a sportsman, though there was a time when I occasionally went out for a day's sport, but always found greater pleasure in the anticipation of death than in the realization. Since neither of the former appears to be the object, I am at a loss to know what it can be but the gratification of pride. Now, pride has a natural offspring—error; and the preservation of game seems too rife with errors. I would just call your attention to another matter, which to me appears monstrous. There is a great rage in the present day for educating the labouring classes. I believe some think that it will strip the nation of crime and immorality; but I fear they will fail in their efforts. But what madness to be at the expense of educating a child for the purpose of making him a more useful member of society, and then exposing him to a temptation which we know he has not sufficient strength to resist; and by falling into that temptation, he will become a useless member of society? I am fully persuaded that whatever be expended in educating the labouring classes, it will be incapable of arresting the demoralizing effects of the game law. Game, in its primitive sense, consists of birds and wild animals that a person cannot keep in his own domain. There was a time when this country was infested with wolves and various kinds of game which are now become extinct. It is man's first work, when he takes possession of an uncultivated country, to destroy these wild creatures that would otherwise destroy his crops and domestic animals; he is therefore possessed of an instinctive feeling for their destruction. Thousands are at this time in different parts of the country engaged in that avocation preparing the way for civilization. Man has a direct command from his Maker to "replenish the earth and subdue it;" therefore game must fall before civilization. The game laws appear to be almost the only relic of feudalism, and I believe its days are numbered. If our game laws were abolished, and hares, pheasants, and partridges, made the property of the occupiers of land (whose in reality they are), what a change would immediately take place in this country! There would be a sprinkling of game on every one's land, but not enough to be an inducement or temptation to poachers. Farmers would protect and value that as much as the rest of their stock, for the sake of giving their friend some sport; and their landlord would be their principal friend, and most tenants would be delighted to be able to give him some sport. Instead of tenants stepping into a pheasant's or partridge's nest, and encouraging their labourer to such practices, they would instil into their minds different principles. Friendly feelings would grow up between landlords and tenants; land would improve, and labour increase; crime would diminish, and consequently the burdens on land. Friend Bright, as he is sometimes called, professes to have much sympathy for farmers as regards game; but let us have nothing to do with *him*, for depend on it, his are "crocodile tears" (laughter).

Proposed New Lease.—I will now submit for your consideration the outlines of a lease of my own construction, which I believe to be calculated to promote agricultural improvements to a very great extent, far beyond any one's conception at first sight. If such leases were generally adopted, they would decide that important question which has so long engaged the public mind, namely *tenant-right;* and I cannot conceive what objection landlords can have to the granting of leases, since their interests, and that of the tenantry, in that respect are identified. I believe it is impossible for the legislature to frame a bill that would administer justice generally, either to landlords or tenants; the situations of farms, and circumstances connected with them, being so diverse.

Land should be let on progressive principles, with corn rents, which would justify and encourage tenants to improve the land, and give landlords an opportunity of participating in the improvement. On letting a farm, the average price of wheat for the last seven years should be ascertained. It should first be let for twenty-one years, at a rent then to be agreed on for the first seven years; the rent of every successive seven years to be governed by the price of wheat during the seven preceding years. At the expiration of every seven years, if landlord and tenant agree, a fresh valuation should be made of the farm, and another seven years added to the term; but should not that addition be made, the tenant would then have fourteen years' notice to quit, when, of course, he would discontinue his improvements; but he should not be allowed to rack, or reduce the land from its improved condition, because he has fourteen years' interest therein—sufficient time to reimburse himself.

Now I will suppose a farm of 100 acres to be let as before mentioned, for a term of twenty-one years. It is ascertained that the average price of wheat the preceding seven years has been 20s. the Cornish bushel, therefore the tenant agrees to pay £100 per annum for the first seven years of the term. If the price of wheat the first seven years should prove to be 21s. the bushel, then for the second seven years the tenant would have to pay £110 per annum; or should it prove to have been but 19s., the tenant would have to pay £90, and so on, for the increase or decrease of every shilling on the Cornish bushel of wheat the rent should increase or decrease £10 per cent. per annum. I think it right to extend the average over seven years, in order to prevent great fluctuations, which would be very inconvenient to landlords and tenants.

This farm of 100 acres is let for twenty-one years at the rate of £100 per annum for the first seven years. If at the end of the first seven years the landlord and tenant cannot agree on the rent for a fresh seven years to be added to the term, arbitrators and their umpire shall be chosen in the usual way, and they shall fix the rent, being governed in fixing the rent by the price of wheat the previous seven years; indeed, all matters that cannot be agreed on by landlord and tenant shall be decided by arbitration in the usual way.

The landlord to lay out all money necessary for permanent improvements; to take the green crops and hay grown on the farm the last year of the term; to be at liberty to work mines and quarries by paying the tenant for damage done; to pay the tenant for all damage done by game; to pay the tenant one shilling per annum for every tree growing on the hedges after it becomes ten years old. (Here I would remark, if the tree is not worth to the landlord more than one shilling per annum it should not stand, because it will do the tenant more than that amount of damage; and further, if landlords wish to gratify their eye with timber, there is nothing to prevent them, but it must not be grown at the tenant's expense). The landlord or his agent shall at all times be at liberty to view the farm, and if at any time they consider that the tenant, from mismanagement or neglect, is injuring it, they shall be at liberty to call in arbitrators; and should they agree that the farm is injured, they shall fix the amount of damage, which amount shall be immediately paid by the tenant, with all expenses attending the said arbitration; but should they fail to prove damages, then the landlord shall pay all expenses attending the said arbitration.

In case of the death of the tenant, the landlord shall take possession of the farm, and pay his heirs or executors his interest therein.

The tenant shall keep the premises in good repair, it first being put in that state by the landlord; shall insure the buildings against fire; shall pay his rent half yearly; and all tithe, rates, and taxes, when they are demanded; shall be at liberty to manure and manage the farm during the term in any way he thinks proper, provided he does not injure it; and should he at any time, from neglect, cause the renting value of the farm to diminish, he shall pay the landlord the full amount of damage. The tenant shall pay the landlord £1 per cent. per annum more for all money expended by him in permanent improvements, than it could be borrowed for on land security.

This, Sir, is a rough sketch of a lease of my construction, which, according to custom, is very lengthy, too much so to occupy our time this evening; though, I believe, it might be condensed into very few words. In conclusion, I will explain some of the advantages likely to accrue from this lease, and contrast them with our existing leases; and I do not know any better way of explaining it than by stating how I stand affected at present, and how I should act if under such a lease as I have just given you a sketch of. I would first remark with regard to my lease, it lies unnoticed on "the shelf;" but this I know, that my term extends to fifteen years only. I manage the farm in every respect as I think proper, and I do not complain of game, or timber, or any interference; but what I complain of is that I am not justified in continuing my improvements—I have occupied Trescow Farm eight years, and in that time have greatly improved it; and in making those improvements I have felt great pleasure, though as yet they have proved unprofitable. But now, having seven years only remaining of my term, I do not feel justified in continuing my mprovements, from the uncertainty of my tenure. If I were to continue them to the end of my term, the probability is that the steward would be sent to value the farm, and it would be his duty to state what he considers it would let at, if offered to the public; and if I took it again, I should have *immediately* to pay for my improvements; and if I should leave it, I must, of necessity, leave much capital locked up in the soil —therefore I find it necessary henceforth to cease my improvements. Consequently I shall be doing "penance" for the next seven years, whether Popery prevails in England or not (laughter); because farming is my hobby, and agricultural improvements afford me the greatest pleasure and satisfaction; and to improvements we must look for profit. And, further, I am not justified in continuing to improve the farm; for, in the absence of a corn rent, if present prices of agricultural produce continue, I shall not long be able to hold possession of the farm. But what would be my position at present, if holding the farm under my proposed lease? I should have improved it considerably more than I have at present; should have applied to my landlord, and have had great improvements made in the farm buildings; should also have had much land drained; and these improvements, in connection with others made by myself in the general condition of the farm, would have assisted me to stem the present difficulties; and, though my rent for the next seven years would not be reduced more than about £10 per cent., still I should be justified and encouraged to continue my improvements, knowing that if the present prices for agricultural produce continue, my rent for the following seven years must be reduced considerably; and it is well known to every practical agriculturist how much more profitable it is to cultivate land in high condition than in low, it being attended with less expense, while its produce is generally one-third greater. Now what effect would my lease have on landlords? Why, in fourteen years their land would increase in value twenty-five per cent. They would, in addition, receive one per cent. profit, on all money expended on their land; nay, I believe, two per cent. more than if laid out in purchasing land, afterwards to remain unimproved, as is too often the case. They would have power to dispossess all bad tenants—those that would not improve their land—which is their duty. No person should be allowed to occupy land in this country, which is so thickly populated, who does not endeavour to make it produce the greatest possible amount of food and labour; and I am satisfied if landowners generally could see as clearly as I do the tendency this lease has to foster that, and the improvement of their land, they would immediately adopt it. There is one objection I have heard raised by some landlords and tenants; they consider the variation of ten per cent. on the rent, for every one shilling fluctuation on the bushel of wheat, to be too great; but that objection might be removed by varying half the amount, which would be equal to the Scotch principle of corn-rent. But I contend that the landlord is the proper person to take the consequence of the fluctuation in the price of agricultural produce. Then the variation of rent should be £10 per cent. If landlords were to take the responsibility on themselves, I am persuaded they would receive the highest rent for their land. It is frequently said land should be let on mercantile principles; and what is meant by that? I consider mercantile principles to be the realization of a certain profit after paying expenses, and land should be let on those principles. Then tenants would be able to make their calculations, on taking a farm, with corn at a certain price, what rent they could pay and realize a profit. They would then be justified and encouraged to improve the farm, since their extra profit would depend on their skill. With these remarks I beg to conclude, and shall be glad to answer any questions in order to explain the subject more satisfactorily (applause).

DISCUSSION ON LEASES.

There was a discussion of some length on the lecture, but many of the questions asked were merely for drawing out explanations from Mr. Olver, and the answers given only reiterated the substance of his lecture, in regard to the new form of lease which he had proposed. The lecture was greatly approved of, and several of the members stated that they almost entirely agreed with Mr. Olver's opinions. Mr. Olver stated his persuasion that the suggestions in his lecture, as to what should be done between landlords and tenants, would, if acted on, be for the advantage of both. It was frequently thought that proposals emanating from a tenant farmer must be prejudicial to the landlords' interest; but this arose from the want of practical knowledge on the part of the landlords; the day he thought would come when they would appreciate the suggestions emanating from tenant-farmers.—In reply to Mr. C. Whitford, Mr. Olver said he intended his plan of lease to apply only to arable, and not to grazing farms: the ten per cent. fluctuation in the rent which he had spoken of would be too great on grazing farms. He intended his plan to apply locally; there was very little grazing land in Cornwall, and what there was would be more profitable if it were cultivated, and crops grown under the alternate system, the climate and soil being favourable to the growth of roots.

Mr. W. TRETHEWY remarked that a great part of the land left out to grass in this county was in consequence of the covenants in leases not allowing it to be broken up, whereas if it were broken and sown to oats, with artificial manure applied, it would amply repay for cultivation; but when a field was in grass, and paid in that state, it should not be broken merely because it was its turn. With regard to land in general, under any circumstances, if it would not pay when well farmed and well manured, it would not pay when badly farmed. With respect to the outlay on a farm, he was of opinion that all the permanent improvements should be made by the landlord, and that the tenant should pay interest on the money expended. The tenants in Cornwall had not generally more than sufficient capital to cultivate their estates, and for them to lay out money in improving their farms would be impoverishing them and reducing the capital they had for cultivation. He considered that draining should all be done by the landlord, the carting of the materials, &c., &c., should be paid for by the landlord, and the tenant should pay a per-centage on the outlay; and he might remark that he believed with Mr. Olver, if the land throughout England were cultivated as it ought to be, that it would be capable of maintaining the present population. With regard to corn rents, he was an advocate for that system, and did not see what objection there could be to it. They knew that in Scotland corn rents had been adopted for a great number of years, and they were told that in Scotland the land was better farmed than in England. They were at least given to understand this until Mr. Pusey made a tour through Scotland, and through some of the counties of England. He said that in going through the Lothians he found the land was very well farmed; but when he got back on the hills, where the land was thin, he found it very badly farmed indeed. He also went into Norfolk, Lincolnshire, and two or three other counties, and the result was that he offered £100, that he would show four or five, or a certain number of farms in England, to compete with the farms in the Lothians. But it should be remembered that the farms he spoke of were in counties (particularly in Lincolnshire) where they have leases, corn rents, and tenant-right (Hear, hear). And he believed, if they had corn rents in this county, the system would tend eventually to the benefit of both landlords and tenants (cheers).

Mr. **Stephens**, of Golden, thought the improvements made in an estate should be ascertained at the end of the term, and the value divided between landlord and tenant, and that the whole should not go to the landlord, as was the case in Mr. Olver's proposed plan. On this point he read from a speech by Mr. Chawner, delivered before the Burton Farmers' Club, and which strongly condemned the restrictions in the covenants of leases, observing that "some lawyer looking through the dim of his window in a back office, ventures to tell a practical farmer how many times to plough his land, how many loads of manure to convey to his fallows, and what crops should succeed each other, be the changes of the weather or the varieties of soil what they might." He also read an extract from a speech by Mr. Bass at the meeting of the same club, who observed that "many of the landlords objected to the agitation of the tenant-right question, as tending to set landlord and tenant together by the ears. He thought they were mistaken, as both were alike interested in coming to a proper understanding on the question; an agreement that was really good for a tenant, he would engage, would in the long run be good for the landlord also. .... He also observed that, in the absence of an agreement to the contrary, the law should give to the tenant compensation for unexhausted improvements, which justice and common sense say belong to him, but which the law, as it now stands, gives to the landlord" (Hear, hear).

Mr. **Kendall** was of the same opinion as Mr. Stephens, that at the end of the term it would be but an act of justice on the part of the landlord to allow the tenant to have half the value of the improvements he had made.

Mr. **Olver** replied that there was great difficulty in the subject of tenant right—the times affected the value of an estate, and it was difficult to ascertain the increase of value which had accrued from the tenant's occupation. Besides, if estates were let on his proposed plan for 21 years, if there was not a fresh seven years added at the expiration of seven years, the tenant would regard that as a notice to quit in fourteen years, and that would be sufficient time for him to reimburse himself for any improvements he had made in the previous seven years. From that time he would cease improving, though he should not be allowed to injure the farm, because he had left sufficient time to repay himself. It must also be remembered, that by his plan, the landlord was to make the outlay for all permanent improvements.

Mr. **Stephens** still thought that if the tenant were assured of half the increased value at the end of twenty-one years, he would go on improving to the end of his term.

Mr. **Olver** hoped the time was coming when landlords would never wish to get rid of a good tenant; and there being no likelihood of leaving, the tenant would go on to improve.

Mr. **Stephens** said there would never be any certainty in the case. In the event of a landlord dying, for instance, his successor might take an undue advantage of the tenant at the end of his term, if he were not protected by tenant-right.

Mr. **Olver** replied that there were difficulties also on the other side. The surveyor that valued the estate twenty-one years ago might be deceased, and how does the next surveyor know what improvements the tenant had made, so that their value might be divided between him and his landlord. It was generally acknowledged that the question of tenant-right was beset with great difficulties.

Mr. **Hanbury**, of Falmouth, thought it but due to the tenant that he should receive, at the end of his term, compensation for unexhausted manures.

Mr. **Olver** believed that where tenant-right exists, it was in the absence of leases. On his plan of a lease, there could not be an unexpected notice to quit.

Mr. **Whitley** agreed with Mr. Olver, in condemning the three years' out system laid down in leases; but he thought two points in Mr. Olver's plan were impracticable. The first was in fixing the rent according to the averages of the past seven years. That was the scale of the tithe rent at the present time, and would only reduce the existing rents five per cent. for the next seven years, according to Mr. Olver's plan; and he (Mr. Whitley) did not think there was a farmer in the room who would be inclined to re-take his estate now on those terms. But if the giving £95 instead of £100 as rent would swamp the tenants, so on the other hand the reduction of ten per cent. in rent, for every shilling reduction in the price of the Cornish bushel, must swamp the landlords. The tithe averages were taken at about one guinea the Cornish bushel, which was now down to 14s.—a reduction of 7s. in price, which would give a reduction in the rent of seventy per cent. Now taking a farm of £200 a year, the reduction to meet present prices, according to Mr. Olver's plan, would be £140, leaving only £60 for the landlord.

Mr. **Kendall** repeated what he before said, in favour of the corn-rent system. Supposing wheat at a guinea a Cornish bushel, barley 10s., and oats in proportion, he would give his landlord the price of 300 bushels, that is 300 guineas for his rent; but if the price came down to 14s. a bushel, or two-thirds of the former price, he would pay his landlord 200 instead of 300 guineas, and so on in proportion; he would pay 300 bushels of wheat for the rent, whether 300 guineas, or 300 fourteen shillings.

Mr. **Olver** said Mr. Kendall's proposal was the Scotch system of paying rent in corn, but in Cornwall the farmers sell as much cattle as corn, and ten per cent. fluctuation in rent for every shilling fluctuation on the Cornish bushel would not be too much. There were some, however, who thought the fluctuation should be divided between landlord and tenant, which would then be five per cent. and correspond with the Scotch system; but he thought the landlords would make a higher rent if they took the whole of the fluctuation on themselves, and they were the persons who should take that responsibility. With regard to Mr. Whitley's remarks, and in reply to some inquiries by Mr. Stephens, Mr. Olver said that taking the averages of seven years, the fluctuations would not be so great as might be supposed. He found that in his case, by acting on his proposed plan, his present rent would be diminished ten per cent. for the next seven years; but even if he were driven to the necessity of borrowing money to make improvements, he might do so, because if present prices continued he should be sure (on his plan of leasing) of a much lower rent during the succeeding seven years, and might then repay himself. The change, however, that in consequence of legislation had taken place within the last few years was an unprecedented circumstance, which he trusted would never happen again; and therefore, in entering on an estate, the tenant must consider at the present time what averages he was justified in adopting as his basis of rent. After that the fluctuation in prices would affect the rent as stated in his lecture, that is, supposing his plan were adopted.—Mr. Olver next urged the farmer to make more use of the county papers for propagating their views, and bore testimony to the readiness with which they inserted communications from agriculturists. They should also make known any successful experiments they might have undertaken. He had tried one this year on rather a large scale. He had found some difficulty in growing wheat after turnips, which he believed was often the result of a want of solidity in the land; when the ground was turned up in autumn it did not set sufficiently for the growth of wheat. This year he had put in twelve acres, and drilled in wheat between the rows of turnips. It looked very well at present, and he was rather sanguine of success.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A **Weekly Council** was held at the Society's House in Hanover-square, on Wednesday, the 26th of February; present, Mr. Pusey, M.P., Trustee, in the chair; Earl of Essex, Lord Wharncliffe, Hon. R. H. Clive, M.P., Hon. Dudley Pelham, M.P., Rt. Hon. Sir Thomas Frankland Lewis, Bart., Rt. Hon. T. F. Kennedy, Sir Robert Price, Bart., M.P., Mr. B. Almack, Mr. Baker (Writtle), Mr. D. Barclay, Mr. T. Raymond Barker, Mr. Hodgson Barrow, M.P., Mr. Bastard, Mr. Bethell, Mr. Beale Browne, Rev. T. C. Browne, Capt. Wentworth Buller, R.N., Mr. Burke, Mr. Burton, jun., Dr. Calvert, Colonel Challoner, Mr. Charlesworth, Mr. Christopher, M.P., Mr. Clavering, Mr. Evelyn Denison, M.P., Mr. Dewing, Mr. Druce (Ensham), Mr. Druce, jun., Mr. Dyer, Mr. Ferrabee, Mr. Fuller, M.P., Mr. Fisher Hobbs, Rev. C. E. Keene, Mr. Lakin, Mr. C. Lawrence, Mr. Loft, Mr. Long, Mr. Maddison, Mr. Majendie (Hedingham Castle), Mr. Neill Malcolm, Mr. Marshall, M.P., Mr. Miles, M.P. (Leigh Court), Mr. Moody, Mr. Ralph Neville, M.P., Mr. Nicoll, Mr. C. E. Overman, Mr. Parkins (Chesfield Lodge), Mr. H. Parish, Mr. T. Paynter, Mr. Pelly, Mr. Pendarves, M.P., Mr. Rice, M.P., Mr. Sanford (Nynehead), Prof. Sewell, Mr. R. N. Shawe, Mr. Slade, Mr. Slaney, M.P., Mr. S. R. Solly, Mr. Stansfield, M.P., Rev. T. Stevens, Mr. Strafford, Prof. Way, Mr. Wight, and Mr. Wilson (Stowlangtoft).

DISCUSSION ON FLAX.

I. CULTIVATION OF THE FLAX CROP.

Mr. **Beale Browne**, of Hampen, near Andoversford, Gloucestershire, at the request of the Chairman, favoured the Council with the result of his experience in the Growth of Flax. He had been one of the first members of the Society to call the attention of farmers to the cultivation of flax, which he believed to be the paying crop; and having become acquainted with what had been done in Belgium and Ireland, he had for the last seven years devoted his attention to the conditions under which the growth and management of flax in this country might be carried on in the most economical and successful manner. In Warwickshire, his friend Mr. Gregory Watkins, the High Sheriff of that county, on being informed of the results to be obtained from flax culture, had called the farmers in his neighbourhood together, and formed them at once into a local association for the purpose of consulting together on the best mode of proceeding in adopting the flax crop, and of aiding each other by arrangements tending to their common advantage. Mr. Browne then proceeded, at the suggestion of Mr. Miles, M.P., to state, under the following heads, the result of his practical experience in the cultivation of flax :—

CLIMATE, LOCALITY, SOIL.—His land in Gloucestershire was hilly, and as variable in its character as the climate : it consisted of heavy clays, stonebrash, and sandy loams two feet thick. He believed that no soil, capable of growing anything, was unsuited to flax, provided it were moist and of fine tilth; in fact, that he would not hesitate to grow it on a common turnpike road, with a moist soil an inch thick; at the same time a depth of three feet was found to be the most advantageous for the expansion of its roots. Sir Robert Kane had shown that it takes the least from the soil of any plant; and that, deriving as it did, a large amount of its nutriment from the atmosphere, it was the least exhausting crop that could be put into the ground, provided the manure from the seed and refuse were retained on the land, and only the flax fibre itself carried off; and Mr. Browne had reason to believe that this opinion was now entertained by all parties connected practically with the cultivation of the flax crop. It grew best, Mr. Browne had found, on an old ley or pasture; it also succeeded well after wheat, or even turnips; and the land might be laid down with clover. In all cases, however, it was necessary to obtain as fine a state of soil as possible previously to sowing. In his own case, he gave the land a slight manuring for this crop.

SOWING, WEEDING.—The first great thing in Mr. Browne's opinion, was to get thoroughly clean seed, and he had been desired by his friend, Mr. A. Marshall, of Leeds, to press this point particularly upon the attention of the Council meeting of that day. Mr. Browne had himself suffered great loss by planting foul seed, from the additional expenses incurred in the consequent weeding, pulling, and after management. He had, however, at length, by great perseverance succeeded in cleansing his crop so effectually as to receive from the parties who had used his seed last year the most favourable account of its purity. Mr. Browne then placed before the meeting two samples of the seed he now employed. A week previous to sowing, or even on the very day of planting, Mr. Browne had been in the habit of employing a scuffler or breast-plough for the purpose of moving the ground and thus cutting up the weeds, a preliminary operation that he had found save much subsequent expense in weeding the after-crop. The flax was not so tender a crop as many persons had imagined, for some flax seeds having been accidentally wasted and left on his ground after harvest, produced plants which stood well through the whole of the ensuing winter. He had found the first week in April the best time for sowing the flax seed, and he preferred the broadcast system. He used an old seed wheel that had become too large for clover, and covered the seed in the lightest way possible, with the finest light harrows had on his farm, taking care to cross the harrowing, so as not to pull it in rows. With regard to quantity of seed, Mr. A. Marshall preferred 3 bushels, but Mr. Browne considered 2½ bushels quite plenty, it being of course understood that the seed employed was of the best quality, and of the greatest purity. In reference to the young plant, he might remark that flax was so speedy in its growth that nothing could overtake it. In dry seasons the straw would be short, and the seed abundant; in moist weather, the stalk would be longer but the seed scanty. The expense of weeding was trifling, not amounting to two shillings per acre.

PULLING, STACKING, THRASHING, PRODUCE.—At the end of July or beginning of August, according to the situation, the flax would be ripe and ready for pulling. The cost of this operation—of which the great secret was to leave the ends perfectly straight and the roots in a brush—had been variously estimated by different growers, according to circumstances; he thought 7s. or 8s. per acre too little, and 14s. too much. In his own case he found that 12s. or 13s. was about the expense. If the land is laid down with clover, it should be done directly the flax is pulled; the sheaves should be put in rows, and the land between them rolled. He had found clover good, except in years of great drought. The sheaves were tied evenly with flax straw-bands, and were capped by drawing the bands near the roots of the plant, and thus causing the seed ends of the sheaves to spread out as a covering for the stalks; by this plan the rain was prevented from penetrating the sheaf. The flax, after standing a fortnight or three weeks in the field, was then carted on a dry day to the barn or rick, until convenient to thrash it. In making his ricks, he placed a sack filled with chaff or straw in the middle of the plot on which they were to stand; and each rick being gradually made round this sack as a moveable centre piece, that was gradually pulled up as the work proceeded, an open space or flue within the body of the rick was left, which caused ventilation, and prevented that heating of the flax so injurious to its quality, and to which it is so very liable, as he had found on one occasion to his great loss. Mr. Browne recommended that the ricks should be thatched as soon as possible. The thrashing was performed in Mr. Browne's establishment by beetles; and the sheaves, instead of being untied and spread open, were kept in their bands, and beat first on one side, and then turned over on the other side and beat again. He recommended that the work people should be particularly instructed to attend to this point, which they were apt to neglect. The expense of thrashing with beetles was 7d. or 8d. per bushel. The produce of seed per acre had been variously estimated at from 16 to 24 bushels; he thought 20 bushels might be considered as a fair average of his own crop; and, as far as he could judge, 4 cwt. might be taken as the amount per acre he obtained of the dressed flax. With regard to the flax straw, some had thought that the farmers would be able to get £5 per ton for it; but this estimate he feared would only mislead them: he felt quite certain that £3 per ton was as much as they would generally get. On this point, as on all others connected with this important subject, his whole and sole object was to prevent parties who intended to try the cultivation of flax from being misled in any way in their laudable endeavours to carry it on successfully, either in reference to the investment and improvement of their capital in this new crop, or to its employment among the labourers on their farms.

Mr. SAMUEL DRUCE, of Ensham, then favoured the Council with the result of his practical experience in the growth of Flax in Oxfordshire for the last few years. He called the attention of the Council, however, more particularly to the results of his last year's crop, which he had drawn out for the information of the members into a balance-sheet of expenditure in cultivation and realisation by sale of produce. He thought this statement would satisfactorily show to them the value of the flax-crop, and the attention which under present circumstances it appeared to deserve. His property lay on the Oxford-clay formation; and the piece of ground on which the trial of cultivation to which he referred was made, consisted of a deep red loam, and in extent was 5A. 2R. 36P.

1.—EXPENSES OF CULTIVATION.

	£	s.	d.
One ploughing, at 10s. per acre	2	17	3
Sowing and harrowing, at 1s. 6d. per acre	0	8	7
Weeding, at 2s. per acre..............	0	11	5
Flax-seed, 13½ bushels, at 9s...........	6	1	6
Rent of land, at 48s. per acre	13	14	9
Taxes, at 6s. per acre	1	14	4
Pulling flax, at 14s. per acre	4	0	1
Carting and stacking, at 4s. per acre....	1	2	10
Thrashing...........................	5	7	1
Winnowing	0	12	6
	36	10	4

2.—Sale of Produce.

	£	s.	d.
Sale of flax-seed, 116¼ bushels, at 8s.	46	10	0
Sale of flax-straw, 12 tous 2 cwt. 2 qrs., at £3 per ton	36	7	6
Sale of chaff, at 5s. per acre	1	8	7
	84	6	1

Leaving a net profit of £47 15s. 9d. on the 5 A. 2 R. 36 P. (or a trifle more than 5⅝ acres) of land employed in this trial of flax cultivation.

Mr. Druce concluded his statement by expressing his conviction that the flax crop was not an exhausting crop at all; in fact, that his son had found a piece of wheat after flax one of the best wheat crops he had grown. He thought, at all events, that it would be found a good thing for every farmer to grow some flax on his farm, if only for the purpose of working up his inferior hay, with a paste of beans and flax-seed, as food for his cattle. It may perhaps be interesting to add that Arthur Young some fifty years ago refers to the cultivation of flax in Mr. Druce's neighbourhood, in the following terms: "Eight or nine years past there was a considerable quantity of flax raised in Oxfordshire, at Water-eaton, Hampton, and Yardington, in boggy land; and good wheat got after it by Mr. Cocks, &c.; but at present there is none. A very singular husbandry, however, in this vicinity has been the culture of this plant for the object of seed, for the sole purpose of fattening bullocks: the high price of linseed-cake occasioned this management, which answered well. The flax was watered, and dressed, as in the common way; but the object of the cultivation was the seed for live stock."

Mr. Sanford, of Nynehead Court, Somersetshire, then favoured the Council with some valuable remarks in reference to the cultivation of flax in Somersetshire, where that crop had been grown as long as he could remember, but its cultivation checked in consequence of prohibitions in the leases granted to the tenantry of that county. These prohibitions having been, and, as he thought, very properly, in many cases disregarded, he decided, when he came into possession of his own property some 30 years ago, that a modification should be made in the conditions of the leases granted to his tenantry, by which, in every 100 acres of land 5 acres might be under cultivation with flax, provided the seed were consumed on the land. It had become a standing proverb in Somersetshire, that good wheat crops always followed flax. He thought it would much promote the cause of flax-growing in that part of the kingdom if the farmers could be persuaded to prepare for their own use and satisfaction such a balance-sheet in their respective cases as Mr. Druce had then laid before the meeting; as it was, they contented themselves simply with a knowledge of its value per ton. He attributed much of the discouragement which might arise in its cultivation to the precarious conditions connected with the steeping process. The bundles were laid in ponds of soft water, having neither inlets nor outlets, and were kept submerged by means of heavy weights placed on them; and so ticklish was the watering process, and so nice a point the crisis of the operation, that persons were set to watch the particular moment of completion, as a few hours or even minutes beyond the proper period might entirely prevent its success. The following remarks of Mr. Dyke Acland, on flax cultivation in Somersetshire, may be interesting in this place. He says (Journal XII., p. 732): "The district is singularly favourable to the growth of flax and wheat, while neither the straw of the wheat nor the seed of the flax are consumed to any extent in the district as food for cattle, although the population is large—if not redundant, wages low, and the poor-rates high; and yet it is now generally admitted among good farmers that the judicious combination of the use of straw-chaff with linseed, either as jelly or cake, is one of the most economical ways of making large supplies of meat and manure, while at the same time house-feeding and flax-cultivation both increase the demand for labour. It is surely premature to talk of giving up the growth of flax. Would it not be better to review the whole process of its preparation, and to inquire whether improvements which have been adopted in Belgium, Norfolk, and elsewhere, may not be imported into this district, and combined with the profitable feeding of cattle in addition to the sheep now folded on the land? If some leading proprietor would pick out an intelligent workman, and send him to visit the districts where the preparation of flax has been most carefully attended to, he would confer a great benefit on his neighbourhood."

Lord Monteagle made an interesting statement of his own case in reference to the introduction of the flax crop on his home farm, and at his recommendation on the farms of his tenantry in the south of Ireland. His lordship had been induced, however, more to restore the growth of flax in that part of Ireland than to introduce it, as the cultivation had ceased on account of the want of markets for the produce. But as the progress of information from the north of that kingdom extended itself to the south, he was induced, at the time of the failure of other crops, when there was no longer any retting establishments or large manufacturers left in hi neighbourhood, and the consumer and spinner were gone, to endeavour to bring about the restoration of the crop, and to try it then as the farmers were now about to do in England. He therefore set about its cultivation: he obtained the best seed from Mulholland of Belfast, and received printed instructions from the Flax Society; the flax was grown on his home farm, and on the farm of his bailiff; his tenants, too, were induced to join in the cause, as well as Lord Devon and other influential landowners of the district. They all succeeded, grew good flax, and the specimens received the favourable notice of the Flax Society, his lordship's sample being valued at £63 only at that time on account of the lowness of prices, but which would now fetch £100. How, it would be asked, had the crop succeeded for the farmers? The notion of transporting at a great expense the flax they had grown, in its rough state, offered an insuperable difficulty. If worked by hand, it must be done with all the skill and knowledge within their reach. In his neighbourhood there was no water-power, and he was unwilling to adopt steam power until assured of a market for his produce. In short, his lordship's tenants sent all their flax to him, and he had to buy it off their hands; so that he had at that time more stacks of flax than of wheat on his farm, and had no means of turning the flax to account. If, like the English farmers, he could have availed himself of the scientic application within their reach, and been able to introduce economically either hand-power or machinery, he could then have obtained a market for his produce, and the flax crop would have answered his purpose as a farmer. Some of the land he had planted with flax had been previously rather exhausted, but by cultivating the flax well, that land had become better than any other on his estate: no meadow, indeed, yielded such capital grass as that on which the flax had been grown. The English farmers would enter on the cultivation of flax with all the knowledge, capital, and established modes in the management of land, for which they were so pre-eminent; and his lordship, in conclusion, heartily wished them every success.

Mr. Fisher Hobbs thought the Council were deeply indebted to Lord Monteagle for his kindness in coming among them that day as one of the members of the society, and for the candid manner in which he had detailed to them the origin, progress, and result of his attempt to restore the cultivation of flax in the south of Ireland. That no market could be found for the produce grown on that occasion, was a fact which he thought must serve to instil caution into the proceedings of the English farmers. They had been told that if they lost their capital in corn, they would find plenty of capitalists in Leeds and the manufacturing districts to take the land off their hands. He would undertake to find for those gentlemen, who give no encouragement or support to the practical agriculture of the country, hundreds of acres for their ready purchase if they were inclined to make the investment.

M. J. de Cock Kenefecke, from Belgium, then addressed the meeting. It was an experienced fact, he believed, that Flax required a continual light moisture, such as prevails in Ireland and the Low Flanders; and the great part of England being similarly favoured by its surrounding waters, offered a strong presumption, in his opinion, that the Flax crop must succeed throughout the kingdom. The English farmer might thus, he thought, with confidence expect the following advantages, differing in some respects from those of the Flemish farmer:—

1. A valuable crop of Flax.
2. A good cattle food in autumn from the clover or carrot crop.
3. A genuine article for cattle food in winter from his linseed meal.
4. A good market for the oil produced from his seed.
5. An excellent soil for winter crops.
6. The satisfaction of affording relief to the labouring classes.

He then advocated the preparation in England of coarse Flax, to be employed in Flanders for Russian duck fabrics the sowing of clover with Flax on a brown soil, and the particular manure required for such crops.

II. Preparation for Manufacture.

Mr. Beale Bbowne thought it would be well for the public generally, as well as for the owners, and tenant-farmers more especially, to come to no hasty conclusion on any of the new systems of flax management proposed for their adoption, however plausible such systems may on their first presentation appear to them; but in this pursuit, as in that of higher objects, to "prove all things," and only "hold fast that which is good." The separation of the seed capsules from the stalk, the woody part from the flax-fibre, the flax-fibre from the glutinous matter, and also the flax-fibres themselves from each other, were all important practical objects, for the attainment of which various modes had been proposed, differing from each in efficiency, economy, and the circumstance of greater or less injury, or otherwise, to the flax-fibre for manufacturing purposes. Mr. Browne preferred the hot-water system of steeping to any of the former modes, as it was not only the cheapest, but fell in with the regular routine of business, summer and winter, and could be carried on by the same hands. The removal of the woody part from the flax fibre, by chemical means, was easy to be accomplished, and had long been effected by Professor Faraday, and other chemical friends of Mr. Browne, but in no case, that Mr. Browne was aware of, in which the flax fibre did not suffer injury from such chemical means, and become weak and rotten. Whatever M. Claussen's plan might then be, he feared that he had yet to surmount that difficulty, by employing only such chemical agents as will effect the separation required without injuring the strength of the flax fibre or the yarn into which it is spun. To assure himself of the weakness of M. Claussen's yarns, he had sent for a sample to the mill at Rochdale, where M. Claussen's processes are carried on; and this yarn, which he then exhibited to the members, along with a specimen of cloth woven from it, would be found deficient in the strength required, and inferior to that possessed by the ordinary cotton yarns. Mr. Browne remarked, that in mixing flax and cotton together it was necessary to cut the flax fibre short, and by chemical means nearly to destroy that fibre before it is sufficiently tender to mix with cotton; and then, with the same-sized yarn, there would accordingly be nearly two parts of cotton to one of flax in any cloth manufactured from flax-cotton, as the flax it contained would be about as heavy again as the cotton. He therefore conceived that, as all cloth is sold by weight, the saving would not be so much an object gained by this mixed fabric. He also thought that M. Claussen's manufactured specimen should be examined in cloth, like calico or linen, not in ribbed fabrics like stockings, which afforded no test of excellence. Mr. Browne and a friend of his had succeeded in their attempts to separate the fibres of flax from each other to such a degreee as to confer on the flax the character and qualities of cotton; but by all the processes they had tried, the flax-fibre had become weakened and rotten. They found that

No. 16 thread, ½ Foreign cotton with ½ British cotton, 120 yards long, weighed 83 grains;
No. 16 thread, all Foreign cotton, 120 yards long, weighed 56 grains;

and therefore concluded that it would take ⅓ more of flax-cotton mixture to make the same surface of cloth, and to make it badly, than of foreign cotton alone. The cloth woven from No. 16 thread, ½ Foreign cotton and ½ British cotton, had the appearance of the cloth employed for sieves and strainers. He made these remarks in perfect sincerity, and with no other motive than that of obtaining the truth, and of wishing it to prevail; for should M. Claussen's plan, when perfected, prove to be a better one than the hot-water system he had himself adopted, he would not hesitate to lay that system aside, and try to get from M. Claussen a license for the use of his patent, and its introduction into his own establishment at Hampen.

Claussen's Process.

The Chevalier Claussen (attended by Dr. Ryan, Dr. Bright, Mr. M'Dermott, Mr. Graves, and Mr. J. S. Christopher), then presented himself before the Council, agreeably with his engagement on that day fortnight previously, to lay before the Members a statement of his process for converting flax into a substance having similar properties to cotton for manufacturing purposes, and for improvements in the bleaching of vegetable productions, and of textile fabrics composed of such productions. M. Claussen having laid on the table a copy of the "Specification" at length of these patented processes (as contained in the "Mechanics' Magazine," No. 1,437, published a few days previously, and to which we refer for the convenience of those of our readers who may wish to consult that document in detail), requested Dr. Ryan to explain for him to the Council the nature and bearing of the processes in question.

Dr. Ryan commenced his address to the meeting by stating that since the subject of the Chevalier's invention had been brought before the Council, he had been down to Bradford for the purpose of witnessing on a large scale the practical operation of M. Claussen's plan, and he should now have much pleasure in detailing the results of his observations. Dr. Ryan begged also to remark that he was not there for the purpose of finding fault with any of the existing processes for preparing flax fibre, but merely as the Chevalier's chemical advocate to point out to the Society the advantages of what he might be allowed to term a most beautiful discovery. Before, however, he proceeded further he would take the liberty of answering at once an objection made by Mr.

Beale Browne, that it would be impossible to mix flax cotton or fibre with common cotton, because of the difference in the specific gravity of the two: that flax would make cotton goods heavier. This was Mr. Browne's objection; but Dr. Ryan could inform him that, although flax fibre in its usual state was specifically heavier than cotton, yet, when prepared by the Chevalier Claussen's plan, it became exactly of the same gravity as American cotton. He then proceeded to detail the operations at the works of Messrs. Quitzow and Co., at Apperlybridge, near Bradford, in Yorkshire. He described the process of preparing the straw for scutching as one which only occupied four hours, instead of five days—the shortest period under even the patent of the late Mr. Schenck, the one now patronized by the Royal Flax Society of Ireland. The materials employed by M. Claussen were merely soda and sulphuric acid, and these in such a form and in such quantities as not to injure the most delicate fabric. Thus the proportion of soda was only 1 part in 200 parts of water. The acid was added after the straw had been boiled with the soda; and the objections to the employment of such a substance would be overcome by remarking that the proportion of the acid was only 1 to 500 of water, and that the soda present in the straw neutralizes the whole of the acid, and forms a neutral salt—sulphate of soda. Dr. Ryan then proceeded to state that means had been adopted to ascertain the strength of fibre thus prepared, in comparison with that prepared by Schenck's process, and the result was highly satisfactory. In the next place Dr. Ryan explained the process of cottonizing the flax, or in other words, of splitting its fibre, and converting it into a material which could scarcely be distinguished from the finest American cotton. This he considered the most beautiful and useful portion of the discovery, opening, as it did, a new market to the flax grower, and enabling the manufacturer to spin it on any machinery hitherto employed for cotton, silk, or wool. Dr. Ryan then detailed the process itself, pointing out the elastic force of the carbonic acid gas liberated in the tubes of the flax fibre by the action of an acid on the carbonate of soda, or of potash. He also stated that he came prepared to show to the meeting, practically, by experiment, the processes of splitting and of bleaching—experiments which would render the matter intelligible to every one present.

At this moment Dr. Ryan handed to Professor Way, the consulting chemist to the Society, a copy of Chevalier Claussen's specification; and it may be stated that in a few moments the Professor returned to the Council-room, and remarked that he had just himself tried the experiments according to the directions of the inventor, and had perfectly succeeded in splitting and bleaching some flax fibre. It was therefore suggested to the Chairman by Dr. Ryan, that as Professor Way was a perfectly disinterested party, it would be better for him to operate before the meeting. This Prof. Way did most successfully, bleaching and splitting a quantity of flax in the course of about two minutes.

Although we have long been practically familiar with the expansive effects of aëriform fluids suddenly disengaged chemically from an apparently solid and inert substance like gunpowder, either in fire-arms or the blasting of rocks, and with their elastic recoil when released from the pressure of condensation, as in the air-gun or the liquid gases of Dr. Faraday, we were not prepared for so beautiful an instance of the application of this principle as the one Chevalier Claussen has given us in the splitting of vegetable fibre, by conveying into its interstices the carbonic acid gas concealed in condensation and chemical alliance with soda, and then setting it free by the addition of acid, which breaks off that alliance by its own superior elective affinity for the alkali. Means shown in their result to be so powerful, and in their operation so gentle yet decisive, gave to the simple experiment made in the presence of the Council by Prof. Way, more the air of a new instance of Natural Magic than the sober reality of an ordinary operacion of natural laws, of which the application only was novel; and its effect on the meeting was accordingly both singular and striking, occasioning evident marks of their agreeable surprise and admiration at the result obtained. The flax fibre soaked in the solution of sub-carbonate of soda was no sooner immersed in the vessel containing the acidulated water than its character became at once changed, from that of a damp rigid aggregation of flax to a light expansive mass of cottony texture, increasing in size like leavening dough, or an expanding sponge. The change was no less striking, when this converted mass in its turn was placed in the next vessel which contained the hypo-chlorite of magnesia, and became at once bleached, attaining then the colour, as it had just before received the texture, of cotton.

After the performance of this experiment, a very lengthened and interesting conversation ensued between the Chairman and Council on one side and M. Claussen and the parties connected with flax culture and management on the other, on various topics, among which were—the point to which farmers, who were inclined to grow flax, would have to proceed to render their produce in a fit state to be taken off their hands by M. Claussen or his agents; the £10 machine of Mr. Davy, of Crediton, for reducing the bulk of flax to be worked by hand; the machinery for cutting the flax into proper lengths; the difference between the flat fibre of cotton and the tubular fibre of flax; on the relative strength of the two fibres; on mechanical preparation of flax without steeping, by Mr. Davy; on specimens of flax grown from prepared seed, and on the treatment of flax for the stronger purposes of manufacture, without steeping, by Mr. Donlan; Mr. Christopher, M.P.'s report of Mr. Bright's opinion of flax-cotton, and its probable employment, to a considerable extent, should the price of foreign cotton remain as high as it then was; his reference to experiments carrying on at Manchester, to caution on the subject, and the inconvenience of inequality in length of fibre; M. Claussen's opinion that by mechanical means flax will never be brought into the state of cotton; on a flax coat manufactured at Mr. Browne's establishment, in which the flax yarn or cordage was so arranged as, by its swelling and torsion, when exposed to rain, to render the cloth compact and impervious to further penetration of wet within its substance.

III. Royal Flax Society of Ireland.

A deputation from the Royal Society for the Promotion and Improvement of the Growth of Flax in Ireland waited upon the Council for the purpose of aiding the Royal Agricultural Society of England in their consideration of the agricultural bearings of flax culture, by offering to them whatever amount of experience the Flax Society had gained, during the ten years' period of its establishment, in the growth and management of that crop, and preparation of the produce for manufacturing purposes The deputation consisted of the Earl of Erne, Lord Monteagle, Lord Naas, Sir James Stronge, Bart., Sir R. A. Ferguson, Bart., M.P., Mr. J. G. Marshall, M.P., Mr. Conolly, M.P., Mr. Russell, and Mr. Macadam; and having presented to the Council, for the use of the Members, a supply of copies of the seventh and tenth Reports of the Royal Flax Society, they informed the Chairman that their secretary, Mr. Macadam, would, with his permission, read to the Council a statement relative to the culture and preparation of flax, signed by their President, the Marquis of Downshire.

The Chairman expressed the great pleasure it gave him to receive, on the part of the Council, the deputation who had on that occasion favoured them with their attendance. The valuable labours of the Flax Society were well known and appreciated throughout the United Kingdom; and Mr. Macadam's excellent Prize Essay on Flax, in the Journal of the Royal Agricultural Society of England, did him great honour, and was often referred to by the Chairman with pleasure and satisfaction.

The Chairman then desired Mr. Macadam to proceed in reading the statement to which reference had been made by the deputation. As this document has already been printed for circulation, it will only be necessary, in this place, to enumerate its leading points—

1. That although established especially in reference to the cultivation of Flax in Ireland, it has always considered the question a national one, affecting the whole of the British Empire.
2. That the Society feels anxious to make its long experience and practical knowledge available in directing those who have now become aware of the importance of the subject.
3. That it may be useful, at the present time, to refer to a few leading facts connected with the history of the Society and its operations.
4. That the Society had with much surprise observed attempts lately made, by interested parties, to impugn its motives and decry its utility.
5. That the present occasion should be made available to show the injustice of those aspersions, to set agriculturists right upon points where they may have been led astray, and to urge a timely caution on those who may be carried away by plausible but unfounded statements to attach too much weight to speculative projects.
6. That the Flax Society express their hope that M. Claussen's sanguine anticipations may be realized.
7. That a notice should be taken of a few of the most important points on which erroneous information has recently been conveyed.
8. That all members of the Royal Agricultural Society of England disposed to cultivate flax should be strongly recommended to adopt, in the first place, the most approved method now practised in Ireland, and to prepare their produce for the great and certain market offered by the linen manufacture.

On the motion of Colonel Challoner, seconded by Mr. Parkins, the thanks of the Council were voted to the Royal Flax Society of Ireland, for the favour of the statement they had then communicated to them, and the cordial co-operation they offered to the Royal Agricultural Society of England in promoting the successful cultivation of the flax crop in England.

Among the visitors present at this meeting were, M. F. Demann, a distinguished cultivator of flax in Belgium, introduced to the Council by Mr. Marshall, M.P.

Communications on flax culture were received from Mr. J. Hill Dickson and Mr. Edward Oliver, and reserved for consideration at a future meeting.

The Council then adjourned to their monthly meeting on Wednesday, March 5.

A Monthly Council was held at the Society's House, in Hanover-square, on Wednesday, the 5th of March; present, His Grace the Duke of Richmond, K.G., President, in the Chair; Lord Southampton, Lord Portman, Sir Charles Lemon, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Mr. T. Raymond Barker, Mr. Brandreth (Houghton House), Mr. Burke, Colonel Challoner, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Jonas, Mr. Kinder, Mr. Marshall, M.P., Mr. Milward, Mr. Pendarves, M.P., Mr. Sanford (Nynehead Court), Prof. Sewell, Mr. Shaw (London), Mr. Villiers Shelley, Prof. Simonds, Mr. W. Simpson, Mr. Stansfield, M.P., Prof. Way, Mr. Jonas Webb, and Mr. Wilson (Stowlangtoft).

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, laid before the Council the report on the accounts of the Society to the end of the previous month; from which it appeared, that the current cash-balance in the hands of the bankers, at that time, was £2,571 (including £749 received on the life-composition account). The Chairman then laid on the table, for the information of the Council, the quarterly statements of income and expenditure, funded property, and liabilities. This report was adopted and confirmed.

Essays.—Mr. Pusey, M.P., Chairman of the Journal Committee, transmitted to the Council a report on the essays sent in to compete for the prize offered by the Society in that department, on the Farming of Northamptonshire, the Diseases of Farm Horses from mismanagement, Diseases of Cows and Sheep after parturition, the Production of Butter, Agricultural Chemistry, and the Agricultural Geology of England and Wales. Many of these essays were of an interesting character and elaborate in their details. The whole were referred, as usual, to the Journal Committee, for adjudication.

Hampton Court Meeting.—Lord Portman reported to the Council the satisfactory progress of the General Middlesex Committee in their consideration and carrying out of the details referred to them by the Council, connected with the preparations for the ensuing Country Meeting of the Society, to be held in Bushy Park, in July next. The last day for receiving entries for the Society's Show of Live Stock, for breeding purposes, to be held in that Royal Park, by her Majesty's gracious permission, would be Saturday the 17th of May, next.

Veterinary Grant.—On the motion of Lord Portman, seconded by Mr. Shaw, the sum of £200 was voted to the Royal Veterinary College, as a grant for one year; for the purpose of aiding that Institution to carry out one of the original objects of the Society; namely, "The improvement of the veterinary art, as applied to cattle, sheep, and pigs."

Trustees.—On the motion of Mr. Brandreth, seconded by Mr. Villiers Shelley, Colonel Challoner was unanimously elected one of the Trustees of the Society, in the place of Sir Francis Lawley, Bart., deceased.

On the motion of Mr. Raymond Barker, seconded by Mr. Stansfield, M.P., Mr. Pendarves, M.P., was elected to fill up the vacancy in the general body of the Council occasioned by the loss of Sir Francis Lawley.

The Council then adjourned to their weekly meeting, on Wednesday, March 12.

A Weekly Council was held at the Society's House in Hanover-square, on Wednesday, the 12th of March; present, Sir Robert Price, Bart., M.P., in the chair; Baron Mertens, Sir Thomas Dyke Acland, Bart., M.P., Mr. Bastard, Mr. Bosanquet, Mr. Beale Browne, Dr. Calvert, Mr. W. G. Cavendish, M.P., Mr. Dyer, Mr. Fuller, M.P., Mr. Gadesden, Mr. Garrett, Mr. Fisher Hobbs, Mr. Maddison, Mr. Majendie, Mr. C. E. Overman, Mr. Pendarves, M.P., Mr. Rowlandson, Professor Simonds, Mr. Aug. Smith, and Professor Way.

Country Meeting of 1851.—The Duke of Richmond forwarded to the Council a letter addressed to him, as President of the Society, by the Mayor of Kingston-on-Thames, offering to the Society, in the most handsome manner, on the part of the Corporation of that ancient and royal borough, the free use of their Guildhall, Assize Courts, and other public rooms, for the use of the Society during the period of its ensuing country meeting to be held in Bushy Park, "hoping that the Council of the Society would do the Corporation the honour of accepting the offer." This communication was received with the best acknowledgments of the Council, and referred to their next monthly meeting.

A deputation from Windsor, consisting of the Right Hon. John Hatchell, M.P., Attorney-General for Ireland, the Hon. A. Leslie Melville, Colonel Reid, M.P., and Mr. Darvill was then announced, requesting an interview with the Council, for the purpose of endeavouring to induce the Society to hold its Country Meeting, not in Bushy Park, but in the Home Park at Windsor, in the immediate vicinity of the Castle-walls, where superior advantages of every kind would, in the opinion of the deputation, be found for the arrangements of the meeting itself, and for the more distinguished promotion of the truly national and patriotic objects of the Society. The Council expressed their regret that the circumstance of their being then only in weekly session, when, by the bye-laws, their proceedings were connected only with discussions on points of practical farming, without the power of legislative functions, would not allow them to receive the deputation which had on that occasion honoured the Council by their attendance: but Sir Robert Price and Sir Thomas Acland joined the deputation privately in the library of the Society, and explained to them the nature and extent of the arrangements already made for holding the Country Meeting of the Society at Hampton Court, and the show of live stock in Bushy Park, on a site of ground within the royal domain, most graciously accorded by her Majesty for the use of the Society for that purpose. They also stated to the deputation that the Monthly Council could receive any statement on the subject, which the Weekly Council had not the power to do; the deputation, however, might address themselves to the Duke of Richmond, who had the power, as President of the Society, to call a special Council at his pleasure.

Mr. Rowlandson, a member of the Society, well known to its members by his numerous Prize-Essays in their Journal, favoured the Council with the following communication:—

March 10, 1851.

In order to contribute my mite of information respecting the Flax crop, I forward this communication; prior, however, to giving any recommendation which my experience may suggest for the future guidance of the agricultural body generally on this important subject, I wish to say a few words respecting a matter which has of late created much noise, viz., the influence which certain alleged discoveries respecting the conversion of ordinary Flax into Flax Cotton may exercise upon the growth of this crop.

The conversion of fine Flax into cotton is about as sensible as though it were proposed to transmute gold into silver or silver into copper. The difference in cost between articles manufactured from cotton or Flax, does not so much exist in the cost of the raw material as in the more expensive manufacture of one over the other, particularly in the bleaching process; cotton fabrics can be bleached rapidly and, comparatively speaking, inexpensively, whilst the finer kinds of linen can only be what is termed Grass bleached. If Flax fabrics could be as inexpensively bleached as cotton ones, the lower price of the raw material of the former would fully compensate for the more expensive spinning process. The following comparative tables of the commercial values of the raw material will show this:—

COTTON.

Surats, 4d. per lb. or............	£37	6s.	8d.	per ton.
Uplands, 6d. per lb., or	56	0	0	„
Sea Islands, 1s. per lb., or	112	0	0	„
Ditto, to 1s. 8d. per lb., or	186	13	0	„

JUTE,* HEMP, AND FLAX.

Jute, 3d. per lb., or	£28	0s.	0d.	per ton.
Hemp, 3½d. per lb., or	32	13	0	„
Common Flax, 4½d. per lb., or....	42	0	0	„
Middling Flax, 6d. per lb., or	56	0	0	„
Fine Flax, 9d. per lb., or	84	0	0	„
Extra fine do. 1s. per lb., or......	112	0	0	„
Super. extra do..........	120 to 150	0	0	„

It may be laid down as an axiom that it will not pay the British farmer to grow flax of a quality when dressed worth less than 6d. per lb., or 7s. per stone of 14lbs., which at 60 stones per acre would produce £21. This quantity, however, is much more than is usually obtained. A crop of 40 stones of fine flax at 9d. would, however, return the same amount of money at less cost in manipulation, less exhausting to the land, and consequently less expensive in the cost of manure, and requiring only an inferior soil for its growth; whilst, on the other hand, an extraordinary heavy crop on very fertile land, highly manured, could not be expected to yield more than 80 stones per acre, worth only 4½d. per pound, or 5s. 3d. per stone, or £21 per acre; such a crop would be very distressing to the land. Now, there is not the slightest prospect of the recently-propounded discoveries converting such a coarse flax as last described from one worth 4½d. per lb. into one worth 6d.; in fact, the process can only convert fine flax into a textile capable of making a coarse fabric; if the process can be applied at all, it can only be profitably done with jute and hemp, neither of which can be advantageously grown in England. It is a very erroneous opinion that flax requires either rich land or high manuring: light lands in fair condition are the soils most suitable; in England the green sands are *par excellence* flax soils, but flax may be grown profitably on the Bagshot Sands. The finest crop of flax for quality of fibre which I ever saw grown was some sown on poor gravelly moor incumbent on the gritty or conglomerate lower beds of the old red sandstone in Ireland. I see no good reason why this crop might not be cultivated on the thinnest chalk soils, and certainly is well adapted for growth on the red soils which form so large a portion of the Downs of the south of England. For clays and stiff lands generally flax is wholly unsuitable. The best flax is grown upon freshly broken up lea; as, however, it will be almost too late to prepare lea this year, it may be stated that any light land in good heart may be safely sown with flax from the present time to the 10th of April, premising that the land should be harrowed very fine previous to sowing.

Riga seed should always be sown at the rate of from 10 to 14 pecks of seed per acre, 10 pecks only if intended to stand for seed; on weak land the flax should be sown thicker than on strong land, *very fine flax* should not grow above 18 inches high, at which height, under favourable circumstances, from 45 to 50 stones per acre will be obtained.

The best course for new flax growers to pursue is to grow a small quantity on land of medium quality, but on which no labour has been spared to get it into a fine tilth; seed as above, and pull it for the white or virgin flax, as it is sometimes called, that is, as soon as the most forward of the seed bolls are fully formed; if a wet season, a little later, if a dry one, a little earlier. Another advantage derivable from pulling the flax for white, is, that it can be off the ground, and a crop of turnips be safely sown by the middle of July; by this means the new flax grower can scarcely suffer any loss by his experiment, whilst to the old grower the crop of turnips will compensate for a crop of seed. On favourable soils, such as the green sand, flax and carrots might be sown, as in Belgium. Weeding must be carefully attended to until the flax has overgrown them.

The process of retting is the one most difficult for the farmer to learn; it will therefore be better for the novice at flax-growing to dew ret and pull for the white. Dew retting is accomplished by laying the flax on grass-land exposed to the rains and dew, often for a period of four or five weeks; this forms a good top-dressing to grass-land. It is by no means desirable that any process should be discovered that would take away the retting and preparatory processes from the hands of the farmer; if such is the case, flax must inevitably become to some extent an exhausting crop, and will also deprive farm labourers of a source of employment at the most pinching season of winter.

I may conclude this letter by stating that it is a complete mistake to suppose that our manufacturers are at any inconvenience for a supply of coarse Flax; this can always be obtained from countries where labour and land are cheaper than that employed by the British farmer; and if any invention was discovered to increase that demand, those countries would always amply supply it, and beat the British farmer out of the field. What is really wanted by the manufacturer, and of which there is an increasing demand, is fine Flax, the deficient supply of which has tasked the ingenuity of our manufacturers to the utmost, in order to make a coarse fibre into a fine fabric.

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* Jute is a coarse kind of hemp from the East Indies.

To those having an opportunity the following experiment might be made, say on a three-acre field; two acres sown with Flax, one acre with Barley, the whole seeded with Clover; one acre of Flax to be pulled for white or virgin Flax, and dew-retted, the other acre to stand for seed. This would show a fair comparison of the relative advantages and disadvantages of sowing flax in the place of Barley, after Turnips. On light turnip lands I have great confidence of the success of such an experiment.

(Signed) Thomas Rowlandson.

Mr. Fuller, M.P., then laid before the Council the following balance-sheet of his trial of Flax cultivation on one acre of land:—

Expenses of Cultivation.	£	s.	d.	Proceeds of Sale.	£	s.	d.
Rent	0	12	0	24 bushels of seed, at 8s.	9	12	0
Taxes	0	4	0	Straw	3	0	0
Ploughing	0	8	0	Chaff	0	5	0
Sowing and harrowing	0	6	0				
Weeding	0	3	0				
Pulling	0	14	0				
Carting to barn	0	2	0				
2 bushels of seed, at 10s	1	0	0				
Thrashing	1	0	0				
Cleaning	0	2	0				
Balance in favour of cultivation	8	6	0				
	£12	17	0		£12	17	0

The field on which this Flax was grown, after Oats, at Rose Hill, in Sussex, in 1849, contained 9 acres, namely, 1 acre Flax, 1 acre Mangold, 6 acres Swedes. The Flax was manured in the April of that year, with 2½ cwt. of guano, the Mangold and Swedes receiving 25 loads of farm-yard manure. In October, the whole field was sown with Australian White Wheat, and the crop was quite as good on the acre where the Flax had been grown as on the other part of the field where the root crops had been raised.

The Hon. R. H. Clive, M.P., presented to the Council a sample of Flax grown, and afterwards prepared, by himself. He had for the last 5 years grown about 2 acres of this crop, the produce of the seed, employed by him for feeding his stock, having varied from 16 to 24 bushels.

Mr. Donlan addressed a letter to the Council, stating that a complete set of the machinery, alluded to by him on a former occasion, and intended to enable farmers to bring their Flax crops into a condition for ready sale in British markets, was at that time open to the inspection of the members, at his temporary premises, at the Canal Basin, Warwick-road, Kensington. Mr. Garrett kindly undertook to inspect this machinery, and report upon it to the Council at their next meeting.

Mr. Edward Davy, of Crediton, also addressed a letter to the Council, informing them that having read M. Claussen's specifications of patent, he found nothing whatever in them that interfered with the plans he had matured, previously to that gentleman's coming forward with his new processes for an altered and simple mode of preparing Flax, to render it cheaper, more generally useful, and an advantageous substitute, to a considerable extent, for foreign cotton. He hoped soon to be in a position to lay before the Society drawings or models of his machinery for the use of farmers, with full particulars of cost of erection and working, quantity of Flax prepared per day, and other details; in the meantime his machinery was about to be tried by an intelligent tenant-farmer on sixty tons of Flax straw on his hands, in the state in which it was pulled from the ground. He hoped to succeed in preparing the Flax suitably, and finding for the farmer a market for it, at a remunerating price; as he had already, he stated, produced Flax in a state pronounced, by an eminent cotton-spinner, to be capable of being spun precisely in the same way, and with the same facility as cotton.

Mr. Hill Dickson also favoured the Council with numerous details connected with his own experience in the cultivation and management of Flax.

The Secretary then called the attention of the Council to the spirited manner in which the Royal Agricultural Improvement Society of Ireland, as it appeared by a report of their proceedings then laid on the table, were endeavouring, by their premiums and arrangements, to promote inquiry connected with the practical management of Flax; and to the following remarks made by the Editor of the *Irish Farmers' Gazette* in reference to the ensuing Dublin meeting of that Society:—

> We look forward to the meeting, therefore, which will be held early in the month of August, with the greatest interest. It will take place at a time when the vast crowd of strangers that will visit London during the spring and summer months will be breaking up, and spreading themselves like a great swarm over all parts of the country; and we have no doubt, from the central position of this city, and the great facilities of transit to and from, both by steamers and railroads, that it will be found the most eligible spot by far. Exclusive of the large amount of prizes given for the encouragement of stock, the Council have most wisely increased the premiums for machinery and implements of every description, and have allocated a large sum towards investigating the different processses of preparing Flax, which occupy public attention so much at the present. We look forward, therefore, to this meeting as the most fortuitous that could possibly occur for testing the merits of the different rival plans, and deciding impartially between them; and we hope to have a regular field day between the respective projects known as Schenck's, and Claussen's, and Donlan's, besides several others, on which public opinion is so much divided at present. We shall return to the subject, and in the meantime we lose no time in calling the attention of all our readers to the time and place for this important meeting, and in impressing on them the necessity of making every preparation for rendering it as effective and as truly national as possible.

Salt in Agriculture.—The Baron Mertens, a life-member of the Society, residing in Belgium, attended the Council for the purpose of calling the attention of the members to the great interest felt at this moment by the government and farmers of that country in reference to the value of common salt as an application to the land and crops, and as an adjunct to the food of animals on a farm. As opinions on these points varied so much, according to the circumstances under which the experience had been gained, he was anxious to ascertain, if possible, the best information on this subject, which he thought important to all cultivators of the soil and feeders of cattle. The abuse of salt in Belgium had become, he stated, a real ruin in some cases to the tenant-farmer as well as to the landed proprietor; and he had been given to understand, by some of his friends in England, that it had not answered well with them. Salt he believed to be, to a certain extent, useful to fattening stock, if not forced upon them, but placed in their way in order that they might take as much of it, and at such times as they felt disposed. In France it had been thought very advantageous to live stock, by M. Barral, M. de Beague, and others; but the experiments, in his opinion, were not at all satisfactory. It had lately been found in Belgium that ordinary doses of common salt had proved to be the cause of abortion among the farmers' breeding stock, in one case 22 cows out of 30, and in another 38 out of 40, slipping their calves, in consequence of their having had salt administered to them; some animals, too, in the same house, experiencing similar effects on having salt given them, while the rest, to which no salt had been given, proceeded to maturity in their gestation without injury or mishap. Baron Martens was also desirous of ascertaining whether the reduced price of salt in England had led to a greater consumption of it for agricultural purposes generally. There was one point, also, to which he wished to call the attention of the meeting, namely, whether animals of vigorous constitution, and in high condition from being supplied with a great variety of nutritious food, are affected either favourably or unfavourably by the use of salt when already submitted to a heating or exciting alimentation?—Professor Way referred to the Commissions of the French and Prussian Governments for inquiring into results obtained in this country from the agricultural employment of common salt. He had not himself seen their respective reports, but he believed they were unfavourable to fiscal measures for a cheaper importation of that article of commerce into their respective countries. The salt companies had also directed much attention to the application of this article of their manufacture to the uses of the farmer, with a view to increase its consumption. The evidence adduced in all these cases had been of a very conflicting character; but he thought local circumstances had much to do with the results, in reference to atmosphere, soil and the character of vegetation. Inland districts might receive benefit from an application of salt, which would be superfluous, and even injurious, to those situate near the coast and within range of the saline vapours of the sea. He considered the counties for instance, of Gloucestershire and Somersetshire within such influence. He believed salt did good on chalk; not indeed as common salt, but in consequence of the decomposition effected in it by the chalk, and the two new compounds which resulted from that double chemical action; namely, muriate of lime, a deliquescent salt, retaining moisture on the chalky soil imbued with it, and carbonate of soda, a salt useful in many cases in promoting the growth of plants or the decomposition of animal matter. The fishery salt employed with so much success by Mr. Fisher Hobbs, contained not mere salt, but also animal matter, on the advantage of which no doubt existed, and oily matter, on the action and advantage of which there was much difference of opinion, although Dr. Hunter, of York, regarded it as the great principle of the pabulum of plants, when united with alkalies into a soapy compound, soluble in water, and capable of being taken up by their organs of nutrition. Turnips, beet, and other roots contained a large amount of salt in their natural composition, which was accordingly taken in at the rate of something like half-a-pound a day by the animals feeding upon them; while the grasses were almost entirely free from that saline ingredient. He thought the subject of the agricultural use of salt an important one for special discussion on some future occasion; and should it be the wish of the Council for him to deliver a lecture, before the Society in the month of May next, he would willingly make this topic a leading one in such lecture, if such introduction should meet with the approval of the Council.—Sir Thomas Acland remarked that it was an acknowledged fact in the west of England that corn grown on the north coast of Cornwall, and several miles inland from it, not only fetched the best prices, but made better and lighter bread than the corn grown in other parts of that district. That the effect has been attributed to the briny matter brought on that coast and its neighbouring county by the heavy gales from the Atlantic Ocean, to which that portion of the west of England was most exposed. In proof of the extent to which the briny exhalations from the sea could be carried by the wind under such circumstances, he adduced the instance of Lord Clinton's residence, which though situate 20 miles from that element, had been known to have its windows covered with saline incrustations after a storm from the west.—Mr. Karkeek, in his prize essay on the agriculture of Cornwall (*Journal*, vi., 439), makes the following reference to this saline impregnation and deposition, which elucidates the remarks of both Sir Thomas Ackland and Prof. Way—" The salt of the ocean can be detected by the taste on the blades of grass in the northern parts of the county, full ten miles from the sea-shore. The application of sea salt is found to act beneficially on soils in some inland counties, but it is seldom found of any service on those of Cornwall. This seeming anomaly is thus accounted for. There cannot be a doubt that most of our plants in Cornwall get quite enough of this substance, without applying it in the shape of a manure; for when the ocean dashes with violence against the rocks, and the crests of the waves are white with foam, the winds carry away the spray, drifting it along in clouds, and sprinkling it over the surface of the land."—Mr. Dyer could confirm Prof. Way's remark on the value of salt on chalk soils. He had also found great benefit to his sheep from allowing them to have lumps of salt to lick.—Mr. Beale Brown had used equal quantities of salt and lime with advantage as a manure.—Mr. Fisher Hobbs had employed the refuse salt of the pilchard fisheries with much success. Some years ago it had attracted the attention of Dr. Paris (now President of the Royal College of Physicians), on account of its valuable properties in preventing rust in corn, a disease generally attributed to the varying changes of the atmosphere. It had been, Dr. Paris stated, the practice of many farmers in Cornwall to spread about 30 bushels of salt, the refuse of the pilchard fishery, weighing 56lbs. each, per statute acre upon their land, a fortnight previous to the sowing of turnips; and they all agreed that they never had any rust on the following crop of wheat where this was adopted, though before they were greatly affected by it; a statement to which Mr. French Burke adds, that in the course of a very minute inquiry into the causes of rust, undertaken some years ago in this country, and afterwards continued at different periods on the continent, it also appeared that it was never experienced in the immediate vicinity of the sea, unless when the ground was greatly over-manured; and also, that when sea-ooze or sand was employed as a manure, rust was prevented. Mr. Fisher Hobbs believes he was himself the first to introduce this fishery salt into the eastern counties, his attention having been drawn to it about four years ago by his friends, the Messrs. Bolitho, merchants, of Penzance, who informed him that this salt contained ten per cent. of oil and from ten to twenty per cent. of scales and other fishy remains, and was greatly superior to common salt for agricultural purposes generally, but more especially for stiffening the straw of barley. Mr. Hobbs being satisfied, from the nature of the salt in question, and the oils and animal matter which it contained, that it must be superior to common salt, although not of higher price, at once ordered a cargo of it to Colchester, consisting of from 80 to 100 tons, and he had since that time had several similar cargoes for himself and his friends, through Mr. Purser, of New Bridge-street, Blackfriars, the Manager of the London Manure Company. Mr. Fisher Hobbs had applied this salt to all his wheat lands before sowing the grain, at the rate of 2 cwt. per acre, but at different times, namely, 1 cwt. before ploughing and 1 cwt. after ploughing, but before depositing the seed. He had found this plan better than that of applying all the salt at once, as the salt became thus more intimately intermixed with the soil.

He had tried 2 cwt. of guano per acre, mixed with the same quantity of the salt, as a dressing for wheat, and found it very beneficial. He had also applied 2 cwt. per acre of the fishery salt, with farm-yard dung, for root crops—especially for mangold-wurzel and cabbages—and found the mixture very effective. He knew an instance where 2 cwt. of the salt was last year used for wheat, not far from the eastern coast Essex, and the increase of produce obtained was of 3 bushels per acre. Mr. Hobbs considered salt very beneficial for agricultural purposes, when judiciously applied, but injurious when used in excess. He gave an instance of such abuse in the case of his own bailiff, who, having on one occasion incautiously applied 5 cwt. per acre to his turnips, entirely destroyed the crop. In reference to the use of salt in the case of animals, he remarked that while he preferred the fishy refuse for application to land, he used rock salt for all the live stock on his farm excepting pigs, for which he employed common household salt, boiled up with meal and potatoes for their food. For his horses, cattle, and sheep, he invariably used rock salt with success; the two former had always free access to it in their mangers, and the sheep in their troughs. In wet weather the sheep would take a larger quantity of it than in dry weather. In a flock of 200, one-half of which had access to salt, while the other half were debarred from it, the losses among those which had no salt was found to be from 3 to 5 per cent. greater than among those which had salt, when feeding on green crops, or food of too succulent a nature. From some cases, however, which had occurred in his own experience, he was inclined to agree with Baron Mertens in believing that in the case of horses and cattle, as well as of sheep, the free use of salt had probably a tendency to produce abortion. He regarded salt generally as a stimulant and deobstruent, which purified the blood. In conclusion, he considered this subject well worthy of a distinct appointment for discussion at some future time: he should then be prepared to show the superior power of fish salt in destroying insects, compared with that of common salt.—Professor Simonds could bear testimony to the legitimate use of salt. He thought all the objections he had heard generally lay against the abuse of it, and in its being given in too large quantities to animals, or applied too freely to the land. On the contrary, while many plants were benefited by small quantities, others had so natural an appetite for such saline application, that it could not be given to them in excess. He instanced sea kale and asparagus as plants of this kind. Salt in the animal economy had a great influence in promoting digestion and assimilation of the food. He agreed with Mr. Hobbs, that sheep fed on too luxuriant grasses, without being at the same time supplied with salt, did badly. The salt corrected the injurious effect of the food, and promoted the secretion of bile. Salt marshes, he believed, never rotted sheep; while wet pastures and their coarse food invariably were found to do so. In the Royal Veterinary College the horses were constantly allowed to have a lump of salt by them; and when he was himself in country practice, he had salt sprinkled over the hay in the ricks, and found it very valuable for horses, sheep, and cows. He thought it a very important question for the consideration of the Council.—Mr. Overman, as far as his experience had gone, could not agree with Professor Simonds in regarding the salting of hay a good practice; he had himself found it a bad one. He had found great advantage in allowing the horses to have it by them, to take it or not as they felt inclined, but not to force them to eat it with their hay. He thought it good as manure for land when applied in moderation. Farms in salt marshes had the heaviest crops of corn, and never, he believed, any mildew on them.—Dr. Calvert considered salt in moderation as beneficial; it rendered herbage savoury to cattle, and prevented the decomposition of root crops. As long as the salt was not forced on the animals, but only laid in their way, instinct would direct them at what times to take it, and in what amount. Dr. Calvert referred to the avidity with which salt was sought for and relished by the natives of arid regions; and he especially alluded to the remarks of Mungo Park on this subject, in his "Travels in the Interior of Africa," where salt was highly prized, and when a lump of it was obtained it was sucked by the children of the torrid zone with as much eagerness as sugar-candy would be by the children of more genial and temperate climates. We may be allowed perhaps to quote two passages from the pages of that devoted traveller and ardent promoter of African civilization, in illustration of Dr. Calvert's reference to the point in question. In the second chapter of his narrative Mr. Park, in allusion to the articles of merchandize supplied by negro slave-merchants, and to the system of barter between them and the natives, remarks:—"In payment of these articles the maritime states supply the interior countries with salt—a scarce and valuable commodity, as I have frequently and painfully experienced in the course of my journey. Considerable quantities of this article, however, are also supplied to the inland natives by the moors, who obtain it from the salt-pits in the great desert, and receive in return corn, cotton-cloth, and slaves." In his twenty-fourth chapter he further alludes to this scarcity and value of salt, in the following passage:—"In the interior countries the greatest of all luxuries is salt. It would appear strange to a European to see a child suck a piece of rock-salt as if it were sugar. This, however, I have frequently seen; although in the inland parts the poorer class of inhabitants are so very rarely indulged with this precious article, that to say 'a man eats salt with his victuals' is the same as saying 'he is a rich man.' I have myself suffered great inconvenience from the scarcity of this article. The long use of vegetable food creates so painful a longing for salt, that no words can sufficiently describe it." He thought the abuse of salt furnished no argument against its legitimate use. It was a stimulant, and, as such, would promote digestion in animals.—The Chairman concurred with the Members who had favoured the Council with the results of their experience, that a future discussion on this subject might prove of much importance.

Dr. Calvert's paper on the Direct Disposal of Agricultural Produce from the Farmer to the Consumer, without the Intervention of Middlemen, was, at his request, referred to the Journal Committee.

The Council then adjourned to Wednesday, March 19.

A WEEKLY COUNCIL was held at the Society's House in Hanover-square, on Wednesday, the 19th of March; present, Mr. RAYMOND BARKER, Vice-President, in the chair, Lord Ashburton, Hon. R. H. Clive, M.P., Sir Charles Lemon, Bart., M.P., Don Domingo Savignon, Mr. Hodgson Barrow, M.P., Mr. Bastard, Rev. E. R. Benyon, Mr. Bosanquet, Mr. W. G. Cavendish, M.P., Mr. Dyer, Mr. Fisher Hobbs, Mr. Majendie, Mr. Marshall, M.P., Mr. Parish, Mr. Pendarves, M.P., Mr. Rowlandson, Mr. Sanford, Mr. Serjeantson, Prof. Sewell, Mr. Shelley, Prof. Simonds, Mr. A. Smith, Mr. Crompton Stansfield, M.P., Dr. Thomson, Mr. W. H. Walker, and Prof. Way.

The Council, having instructed the Secretary in what manner to acknowledge the Communications then laid before them, and to what department respectively to refer them, adjourned, after a short sitting, to Wednesday next, the 26th of March.

NEW MEMBERS.

The following new members were elected :—

John Villiers Shelley, Esq., of Maresfield Park, Sussex, was elected a Governor of the Society.

Alison, Henry, Park Hall, Chorley, Lanc.
Boughton, Andrew K. Rouse, Acton Hall, Salop
Boyer, J., Skeffington Vale, Leicester
Bridson, Henry, West Bank, Bolton-le-Moors, Lancashire
Briggs, John Atkinson, Bessell's Green, Chevening, Kent
Davy, Edward, The Park, Crediton, Devon
De Grey, The Earl, Wrest House, near Bedford
Elmsall, Mansfeldt de Cardonnel, Woodlands, Doncaster
Fowler, Robinson, Preston Hall, Stockton-on-Tees
Hall, Alexander Hall, Watergate, Emsworth, Hampshire
Hogg, Frederick, 40, St. James's-street, London
Hopkins, W. H., Fairmile, Henley-on-Thames
Jones, Harvey Bowen, 49, Montague-square, London
Macartney, George, Lissanore, Co. Antrim, and Bourton, Warwickshire
Marshall, George Hibbert, 38, Eaton-square, London
Page, T., 2, New Scotland-yard, Whitehall
Parish, Henry Headly, Chesham-street, Belgrave-square
Pierson, James Alexander, The Guynd, Arbroath, Forfarshire
Savignon, Don Domingo, of Mexico
Soames, Daniel W., Pinner, Middlesex
Smith, Henry, New House, Sutton, Shiffnal, Salop
Spencer, T. S., Hinckley, Leicestershire
Spooner, Thomas, Abbot's-Bromley, Rugely, Staffs.
Towgood, Edward, St. Neot's, Huntingdonshire
Verrall, Richard Relfe, New Hall, Henfield, Sussex.

THE AGRICULTURAL DISTRICTS OF ENGLAND.

FROM THE TIMES' COMMISSIONERS.

COLCHESTER, April, 1850.

The county of Essex has never been looked upon with peculiar favour by the agriculturist, as from the preponderance of clay soils the difficulties and expense of cultivation and of improvement are greatly increased. Its position, as the nearest of the eastern counties to the great metropolitan markets, has subjected it to disadvantageous comparisons while opening up to it vast facilities. Those facilities, both for the disposal of produce and for raising the quality of the land, the proximity to the best examples of Norfolk and Suffolk farming, the intersection of the whole country by railways, and the daily comparison of experiences thus afforded, would lead to the belief that, notwithstanding the impediments which the character of the soil to a great extent presents, the agriculture of Essex must recently have been undergoing a change for the better. We were anxious to examine this matter attentively, for it is undoubted that, whatever the ultimate results of free trade in corn may be on the permanent condition of the land of England, the clay districts are those which suffer most from it at present, and are likely to do so for the future.

The formations which occupy the extent of Essex are chalk, and plastic and London clays. The first mentioned embraces but a small portion of the soil, and the plastic and London clays may therefore be regarded as the preponderating features of it. For the purposes of a survey like ours, three different districts may be taken illustrative of the varieties of Essex clay lands. There is the tract of ground north-west of Chelmsford, a portion of which is called the Roothings, and which is described as a chalky clay. There are the districts lying upon the banks of the Chelmer, the Stour, and the Colne, and which consist of beds of gravel, chalky clay sand, and loam. Lastly, there is the heavy clay district, stretching southwards, of which the Dengey Hundred may be taken as a fair specimen. Over these districts draining has been carried out only to a limited extent, and its advantages are as yet but partially recognized. On the lighter qualities of soil drains are constructed to last for a period as nearly as possible approaching the length of the tenant's legal or estimated interest in the land, and as these are cheaply made and act pretty well for a time, the benefit they confer is readily acknowledged; but on the heavy clay soils, where drainage to be effectual must be thoroughly and therefore expensively done, the advantages to be derived from it are not admitted, and the farmer contents himself by putting his fields into narrow stretches or gathered ridges, with water-furrows, by which to carry off the surface moisture. The mole-plough is used on soils adapted for it. It goes 16 inches below the furrow of 6 inches, which is first thrown out, thus securing a drain 22 inches deep, which has at least the merit of cheapness. But the drains most in favour are those filled with haulm or wood, in the manner hereafter described. There has been very little tile drainage effected in the county, few of the landlords assisting in the slightest degree to carry out this permanent improvement. In many of the other southern counties we found proprietors disposed to give their tenants tiles, but here no such practice exists as a general custom, and the farmers being left often without leases, and always without compensation for such an improvement if adequately performed, the consequence has been that the drainage of the lighter clays is the cheapest and least durable that can be made, and that the drainage of the heavier clays is looked upon as so expensive to undertake, and so inoperative if executed, that the idea of attempting it is entirely abandoned. Such is the slow progress made in this important branch of permanent improvement. On another point—that of improving the texture of the soil by marling and chalking—the benefits arising are readily admitted. The stiff clays in the southern parts of the county are top-dressed with chalk brought from the Kentish coast, often at an expense of £4 or £5 an acre. The other varieties of clay soil in the county are also treated in an analogous manner, though the processes are different, marl being used where it can be obtained, and burnt clay also to a limited extent.

With reference to the farm buildings in Essex some advances to a better state of things in this respect have been made on the estates of Lord Petre and a few others; but much still remains to be done. The common practice appears to be that the tenant should erect the buildings and provide the labour, the proprietor finding the materials. The side walls are usually of wood, and the roof of thatch, though we saw some slated; the yards are profusely littered with straw; the horsepond frequently placed so as to receive the whole liquid manure of the farm; the hay and corn stacks are built up close at hand, and anything more suggestive of the necessity of fire insurance than the whole range of premises it is hardly possible to conceive. In this county incendiarism has of late years been very prevalent, and no one who looks at the mass of inflammable materials, collected as it were in a pile, and inviting the lucifer match of some discontented labourer, can wonder that crime has followed such temptation.

The subject of permanent improvements in farms leads to that of the relations between landlords and tenants in Essex. The holdings are in some districts principally from year to year, in others chiefly on lease; but the former are more general, especially where the farms are small and the occupiers a less enlightened and less enterprising class. In the Roothings, for instance, small farms and yearly tenancies are found usually to go together. Leases, when granted, are generally either 7 or 14, but sometimes 21 years in extent. The restrictive covenants on cropping and other points of farm-management are, among the more intelligent tenants, much complained of; but what appears to have provoked them most is the preservation by some proprietors of their hedge-row timber. Farmers in some districts have been in the habit of making "root ditches," to prevent the roots of trees in their hedges finding their way into the fields, and sucking up there the nutriment intended for the regular crops. We were informed of instances in which tenants were not allowed to take this necessary precaution for the protection of their property, because it would injure the growth of the trees. Can anything be conceived more discouraging to an agriculturist than this? Yet it is only part of a general system which was described to us as prevailing to a very great extent in this county. We were told that the owners of the soil have hitherto, with few exceptions, shown a complete indifference to agricultural improvement, and that they would neither lay out capital themselves in securing a higher state of cultivation, nor would they permit their tenants to do so for them. We asked the reasons of this extraordinary state of things, and were informed by gentlemen of the highest respect, ability, and in every way competent to speak authoritatively on matters involving such delicate considerations—1. That the landed property of Essex is encumbered with mortgage debts and other liabilities to the extent of half its value. 2. that the proprietors are extremely tenacious of the influence which they have over their tenants, and afraid to entrust them with that freedom of action which springs from a thoroughly independent social position. Thus it is said that, while farmers are subject to injurious restraints, and landlords remain deeply embarrassed, agriculture, notwithstanding the facilities which this county affords, advances with very slow and wavering steps. By custom there exists between incoming and outgoing tenants in Essex compensation for acts of husbandry. These acts of husbandry include the value of dung and the rent of naked fallows, the cost of tillage for turnip sowing and hoeing. The management of estates is generally consigned to solicitors, who, having no practical knowledge of the value of land, employ land valuers to come down from London and fix the amount of rent to be charged. Under this system the average rent per acre in districts like the Roothings is under 20s., poor rates being about 3s. 6d. per acre, and tithe from 5s. to 6s. per acre. In the north-eastern districts the rent of land varies from 20s. to 30s. per acre, the outgoings being much the same in amount as those already stated. Labourers' wages we found about 8s. a-week, besides beer, which is considered worth 1s. more. Cottages are scarce, and the rent of them is run up in consequence to £3, £4, and even £5 a-year.

Though the county, as already described, consists of various soils, the system of agriculture followed on the heavy and lighter lands respectively is pretty uniform. Corn farming is the distinguishing feature of the district, and long fallows and diligent hoeing keep the land very clean and free from weeds. The four-course system is generally adopted. Barley is sometimes sown after wheat, when the land is in a rich state, and excellent crops are got by this management.

To illustrate the mode of cultivation we shall take a farm of 200 acres near the Roothings—a clay marl district, some miles west of Chelmsford. The soil is on a gentle slope, by no means strong clay, mixed with small stones and chalk, the fields large and not incumbered with wood or wide hedgerows. The farm buildings are abundantly commodious for the stock at present kept by the farmer. They are erected by the landlord and kept in repair by the tenant, who farms on a lease of 14 years. Where the tenant thinks it necessary, he drains the land at his own expense, making the drains 22 inches deep and about 32 feet apart, and filling them with haulm (stubble). The subsoil being a stiff clay forms an arch over the haulm, which remains open after the stubble itself has rotted away. Such drains are supposed to last a 14 years' lease, and are of much benefit to the land. They are made in the division that is to be fallowed. The fallow is ploughed and harrowed as often during the summer as the farmer thinks it necessary, never less than five or six, and occasionally as often as eight times. A portion of it is burnt annually, and that which is in the most foul condition is chosen for this operation; indeed it is found advantageous to sow rye grass occasionally with the preceding crop, in order to get plenty of roots and organic matter to assist in the combustion of the clay. Early in May the land to be burnt is ploughed very light, well dragged about, and then gathered into heaps, a quantity of haulm having been previously placed in the centre. This is set on fire, and the earth packed round it, care being taken not to let the fire burn through without putting on more earth, while too heavy a quantity at a time must also be guarded against, as that would extinguish the fire. The fires are kept burning slowly night and day till the whole is reduced to ashes. These are spread over the ground at the rate of 100 or 120 yards an acre, and at a cost in labour of from 20s. to 25s. The effects of the burning are that, after it, the land dries sooner, can be worked and sown earlier in spring, and that both the quantity and quality of crops are improved, especially so of barley and clover. Experienced farmers say that the oftener it is burnt the more the soil is improved, and in many cases the process is repeated every sixth year. It is most necessary that the land should be well under-drained before being burnt. Four or five acres of the division in fallow are sown with swedes and mangold wurzel, well manured. Half of this division is sown in autumn with wheat (six pecks an acre), the other half early in spring with barley (four bushels an acre); the barley taking the place of the wheat in the next rotation. The barley land is sown with 14lb. of red clover to the acre, the greater portion of which is fed off and a small portion mown for hay. The wheat is followed by beans, the land being dunged and the seed dibbled in. The beans are not horse-hoed, but kept remarkably clean with the hand-hoe. They are hand-hoed by men at a cost of 3s. an acre for each hoeing, and that is repeated five times in a season if necessary, but never less than three times. The clover and beans are both followed by wheat. In the 200 acres there are thus annually—45 acres in long fallow, five acres in roots, 75 in wheat, 25 in barley, 25 in clover, 25 in beans. The "haulm" already mentioned is the stubble, which is mown and stacked up in long heaps after harvest. The stubble for this purpose is left about two feet long, the farmer arguing that the less bulky he can make his crop in harvest, when wages are high, the better. In this way a much greater number of bushels of grain is carried home in the waggon, stored in the rick-yard, and finally much more easily passed through the thrashing-machine. When the busy harvest period is over, the haulm or stubble is then cut with the scythe, and carried to the field where the operations of burning and draining are to be effected next season. Under this management the crops reaped average 28 bushels of wheat, 40 of barley, and 32 bushels of beans. The whole stock kept on this 200-acre farm is 80 sheep in summer, five or six cows, and 12 or 14 straw-yard cattle. Eight work horses do the horse work; three in a plough in winter, two in summer. The rent is 20s. an acre; tithe and rent charge, 6s.; poor rate, &c., 4s.; or about 30s. an acre altogether. There is no hay or straw sold, and about a ton of guano annually bought.

On the farm of Mr. W. Hutley, of Witham, we found a much more enriching system adopted. By heavy applications of purchased manures, and the conversion of all his straw into excellent dung—by feeding his roots in conjunction with cake and corn, he keeps his land in a high state of fertility. His lighter land he drains, at his own cost, with two-inch pipes, 32 inches deep and 32 feet apart. Heavy land, he thinks, with many others in this county, receives no benefit from tile drainage. His fences are kept very narrow, and the land ploughed close into their roots. On land which is not too heavy for roots, he thinks it advisable to have a long fallow, perhaps once in eight years, on the principle "that soil which is generous to him should be treated gratefully in return." A crop of tares preceding a fallow "draws" the land, in his opinion, to the extent of 20 bushels of wheat an acre; that is, he would expect 40 bushels an acre without a crop of tares, and only 20 bushels when a crop of tares had been previously taken. He manures highly for his mangold wurzel, the yellow globe variety, using 30 loads of dung, 4 cwt. of rape dust, and 2 cwt. guano, per acre. The result is a yield of 35 tons an acre over his whole crop, and that he is now selling at 15s. per ton on the spot, to be sent to London, which is equal to £26 5s. an acre. The green crop thus appears to be much more remunerative than the corn crop when it can be disposed of on such advantageous terms; 40 bushels of wheat per acre, and 56 bushels of barley, are reckoned equivalent crops when the soil is in equally favourable condition. Wheat is sown broadcast, after clover and beans, at the rate of six pecks an acre; barley is drilled in after a long fallow in spring. Mr. Hutley's system is to have one-fourth of his farm in wheat, one-fourth in fallow and roots, one-fourth in barley, and one-fourth in clover, trefoil, and beans. By changing the latter every rotation red clover is repeated only once in 12 years, and a plant seldom or never fails.

In the management of stock Mr. Hutley's practice is to turn his horses into a large open yard in front of the stable after they have had their bait of corn, and here they remain out night and day, when not in the yoke, summer and winter. He is never troubled with grease or other ailments among his horses. His sheep are fed partly in the field and partly in the yards; the couples are fed in the field on roots; 300 tegs are kept in two adjoining yards, 150 in each—one provided with shelter sheds, the other quite open. Both yards are well littered with straw, and in these the sheep have been kept during the winter. They receive roots, cut chaff, and 200lbs. oil-cake daily, among the 300. These are now being sold out at an increased price, between carcase and wool, of 18s. to 20s. for 30 weeks' keep; thus leaving the cost of the cake (about 9s. a-head), a large quantity of rich manure, and 4d. a-week for the roots and chaff. The feeding of pigs is carried on to a great extent by Mr. Hutley. He breeds none, but buys pigs at about 18s., and feeds them five weeks, when they are ready for the London market. They are fed on meal of different kinds, and sometimes on boiled Indian corn. The difference between the buying and selling prices of the pig stock for one year has reached more than £2,000, and seldom falls below £1,200 or £1,500. As this sum goes to pay for the corn consumed by the pigs, it shows how much Mr. Hutley is every year adding to the fertility of his farms. Oxen are fed on meal and chaff; few are kept, as they are not, with this management, a paying stock. Mr. Hutley attributes his success in farming to a liberal application of capital to the land, both by drainage, chalking, artificial manures, and above all, by keeping a large stock and employing sufficient labour. To do this he has been encouraged by a moderate rent and entire confidence in his landlord.

At Tiptree Hall we examined the well-known and much discussed farming operations of Mr. Mechi. The regularity and luxuriant appearance of the wheat crop on the fields next the public road led us to anticipate an instructive visit, and we were not disappointed. It is of course quite unnecessary to enter into any history of the farm, as Mr. Mechi himself has already made that public. We shall therefore confine ourselves to a short description of some interesting matters of detail. The farm is 170 acres in extent, principally a strong soil, with a very impervious clay subsoil. It adjoins Tiptree-heath, which is naturally very barren. By draining, ample manuring, and liberal expenditure, the whole farm is kept in constant tillage, one-half of it every year under wheat, the other half in clover, Italian rye-grass, tares and roots. The wheat is drilled on stetches, about 7 feet wide; it is twice horse-hoed; beans, peas, and tares are also sown by the drill. Red clover is sown on the same land once in eight years, and never misses a plant, 12lb. seed being allowed to the acre. The Italian rye-grass, though thin on the ground, is the most forward spring-feed we have seen this season. Having walked over every field on Mr. Mechi's farm, we have no hesitation in saying that for clean cultivation and healthy appearance of wheat and other crops, it is equal to any, and superior to most farms we have met with in this county.

In the management and accommodation for stock Mr. Mechi is yet experimenting. The stock always kept on the farm are 150 sheep, 200 pigs, young and old, 24 fatting bullocks and cows. Besides roots, 10 sacks of meal are used daily in feeding them. 700 to 1,000 quarters of corn are bought annually for this purpose. All the animals are kept on boards to economise the straw, and, with the exception of some of the pigs, they looked clean and comfortable. Mr. Mechi considers it proved that pork at 6d. a pound will pay for barley at 30s. a quarter, and at 4d. a pound for barley at 20s., besides the manure. Two bullocks are placed in each box, 10 square feet of space being allowed to each. The boards on which they stand are three inches broad, with two-inch intervals. For calves 1½-inch intervals, and for sheep 1¼, are found best. One man feeds 200 pigs, mixing and carrying them food. They are fed thrice a day. A six-horse power steam engine is employed in thrashing the crop, cutting chaff, grinding meal, bruising linseed, hoisting sacks, &c. In short, no expenditure is spared by Mr. Mechi; and whether it has on the whole been profitable to himself or not, there can be no doubt whatever that his example has in many points been instructive to the agricultural community.

In concluding our observations on Essex, we may point to the fact that hitherto the chief dependence of the farmer has been on his corn crops stock being kept for manure, but not generally as a source of profit. Considering the proximity of this county to London, and the consumption of milk which might ensue if the enormous population of the metropolis could obtain a supply of good milk on moderate terms, we are of opinion that farmers would find it very advantageous to turn their attention to this source of profit. Intersected as the county is with railways, there is nothing in the distance to prevent daily supplies being sent to London, and milk is a commodity in which we are not likely to have much foreign competition. To obtain a snpply of this on the clay farms, we should expect a system of house-feeding on clover and tares in summer, and on mangold wurzel, cabbage, &c., in winter—the most economical, while it would also provide an advantageous means of converting into fertilizing matter the haulm which is now looked upon almost as a nuisance by many Essex farmers.

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

(From the Morning Chronicle.)

Letter XVII.

NORFOLK, SUFFOLK, AND ESSEX.

Having received from some of the Norwich manufacturers statements of the earnings of their workpeople, I resolved to visit one or more of the weavers employed in each dapartment of manufacture for the purpose of obtaining their statements on this point, and of informing myself generally as to their social and moral condition. I was told that the employers would be certain to give me only the earnings of the best workmen, and that the other side would be equally certain to give me the lowest amount of their earnings. I found, however, in a great many cases, that the information afforded me by the weavers was perfectly correct, as I had subsequent opportunities of verifying it by reference to the books of some of the manufacturers by whom they were employed.

The condition of the hand-loom weavers of Norwich, like their brethren of Spitalfields, has for many years been of the most distressing character. Low wages and uncertain employment have reduced this class of operatives to the lowest possible state of wretchedness and misery. During the last twenty years the rate of wages has been gradually but constantly diminishing. In the year 1844 the distress of the Norwich hand-loom weavers appeared to have reached its climax. In the month of February of that year an address was issued by the Hand-loom Weavers' Union to the inhabitants of the city of Norwich and its vicinity, in which the wages they then obtained for their work were compared with the amount received in 1829. According to that statement, a hand-loom weaver received for weaving a piece seventy yards long, or eleven dozen nine skeins of yarn, 6s. 4½d.—being at the rate of 6½d. per dozen. If the fabric were checked with two shuttles, 1d. per dozen more was paid. None but the most expert and able workmen could weave, upon an average, more than one piece in the week; and after deducting the expense of winding, candles, and other things, the amount of his earnings for the week would not exceed 5s. 3d.—being about 9½d. for weaving sufficient material for a lady's fancy dress. Several conferences took place between the workpeople and the manufacturers on the subject of an increase in their wages, and a scale of prices was ultimately agreed upon in 1846, which has since been pretty generally adhered to. What those prices were, the reader will be enabled to judge from the statements made to me by the manufacturers, which I have already given, and from those of the workpeople, which I shall now proceed to detail.

The first person that I visited was a weaver, residing in White Lion Court, St. Pauls', who was employed in weaving barège—a fabric of a light gauzy nature, used for ladies' dresses. The court in which he resided was approached from the main street by a low and narrow archway. There were twelve houses in it, of two rooms each; there were no back premises to any of them, but in the front were small patches of ground of about eight or ten feet in length, by about the same in breadth. A row of eight houses occupied one side of the court; the other was occupied by a stable and slaughter-house. At the bottom, or lower end of the court, were four houses, of the same description as the others, in the corner one of which dwelt the weaver above referred to. Immediately facing the entrance to the house, and joining the little fence, was the privy, used by the whole of the inhabitants of the court; by the side of it was an open bin, into which all the refuse matter was thrown, and into the bottom of which the soil from the adjoining privy drained. Some rain had fallen on the night previous to my visit, and the contents of this open cesspool, oozing through the walls, were streaming sluggishly down the path to the house. A part of this filthy fluid was absorbed by the ground; but some parts of it not unfrequently found their way into the house, the floor of which, as if to invite its entrance, was nearly a foot lower than the ground outside. As usual, the loom was in the upper room, which was used as a work-room, bed-room, and in winter, to save a second fire, as a sitting room. A diminutive little woman—all Norwich women are so—was busily engaged at the loom, and during the intervals of putting the fresh bobbins on the shuttle, I obtained the following information from her. "I do the best kind of barège work. If I commence work at light, and keep on till eleven at night, without being called off to do anything else, I can weave eleven dozen in a week, and I should get 11s. 11d. for that—that is, 13d. a dozen. I pay a girl, who does the winding, 2s. a week and her dinner; then 'beaming-on,' candles, and other expenses would be about 10d.—so that would leave me 9s. 1d. for my week's work. I am rather a privileged person, and if there is any work to be got I usually have the preference; but I am often obliged to 'play.' Before I had the last two canes I 'played' a week, and I played a month right out at Whitsuntide; that was because I couldn't get any work. I suppose for the last twelve months I have played four at least. I am married, and have four children; they are all at school. My husband sometimes works at the other loom. When I do not have this girl to wind for me I can get it done for a penny a dozen."

A person unacquainted with the process of winding could scarcely form an idea of the quantity of manual labour thus performed for a penny. The "dozen" referred to is a dozen skeins, each containing 560 yards, or 6,720 in the dozen: and this quantity has to be transferred from the hank or skeins to small bobbins for the shuttle, by means of a small wheel turned by the hand of the winder. A greal loss of time constantly takes place in consequence of the threads of silk breaking, and of the constant change of the bobbins required when full. At the winding it is physically impossible to earn more than from 2s. to 3s. per week. Of course, the great proportion of this kind of work is done by young children or old persons; but that is not always the case. The person employed as winder in the above instance was a young woman of eighteen years of age, and she received 2s. a week and her dinner; but in addition to winding she was expected to assist in the household duties, in taking care of the children, and other matters, while the woman was at work.

The next person I visited was a fancy barège weaver, residing in Light Horseman Yard, Pockthorpe. This place, like the former, was approached by a narrow covered passage, leading out of Pockthorpe, into a square court with eight houses—some of two and others of three rooms. The waste water and filth from these houses were conveyed along the surface by means of drain-tiles, which had recently been laid down; but previously there had been no drains whatever, the whole of the refuse water either finding its way along the passage which it had worn for itself, or soaking into the ground. The place was disgustingly filthy, and the greatest care was required in stepping to avoid the filth, which abounded in the place. There, as in White Lion Court, the privy was common to the whole of the inhabitants, and in order to avoid repetition of a digusting fact, I will state at once that in no one of the numerous courts and alleys which I visited was there to be found a house possessing an exclusive right to a convenience of this kind. The house in which the fancy barège maker resided consisted of three rooms, one above another. It was an old and ruined place; the stairs (which lay open to the court) were fast decaying; and the flooring of the rooms creaked as you walked over them. The lower room of the three was occupied by the eldest daugher of the weaver, 24 years of age, who was married. The second room was used as a day-room for the family, and a bed-room at night for the husband and wife and two youngest children, one of whom was six months old. The upper room was occupied by the loom, and was used as a sleeping room by the remainder of the family, eight in number. The part nearest to the window was occupied by the loom; at the opposite side of the room were two stump bedsteads side by side, and almost touching each other. Across the frames of these a few cords were stretched, and a coarse kind of sack filled with straw lay upon each. Upon neither of the beds was there any blanket. "There is but one in the house," said the poor man, "and that we have down stairs." One of the beds had an old coverlid, the other a dirty sheet and coverlid. In one corner of the room lay, rolled up, what was called "the third bed"—a bag of straw without any bedclothes whatever. "My eldest son is nineteen," said the weaver, in answer to my questions. "My eldest daughter, eighteen years old, and six other children sleep together in this room. My wife and me sleep down stairs with two of the children; there is an old feather bed there, but it's a very old one—it was given me when I was married, twenty-five years ago. I have never been able to buy any since I have been married. Since last Christmas I have earned—take one week with another—perhaps 8s. I can earn, some weeks, if the children do the winding, perhaps 14s. a week. I have nothing in pawn; indeed, I've got nothing that they'll take in. I have not drunk a drop of beer since the 28th of last February. I am a teetotaller. Lor, sir, the work is so irregular; all this week I sharn't earn sixpence. They keep me dragging up to the warehouse day after day, and they always say, 'There's no shoot to-day, come tomorrow:' and so it goes on. It would take us 7s. or 8s. a week for bread, if we could have all we could eat; but it's never less than 6s., and when we can't pay for it we're obliged to go on tick for it at the 'fogging shops;' that's where they sell heads and plucks, and all them sort of things. I don't think we have to pay any more for bread in consequence of credit; some other things we do, I dare say; and I often think the flour is very short weight. I have to pay 1s. 9d. a week for rent." The whole appearance of this family and of their house and furniture was of the most wretched and deplorable character. The eldest boy was out of work—the daughter worked at the factory, and gave a portion of what she earned to her parents for her wretched food and lodging.

The next case was that of a paramatta weaver, who resided in Dible's-hole, a place situated close to the city walls, in the parish of St. Paul. The access to this Dible's-hole was by means of a narrow passage, flanked on one side by the ruins of the old city wall, and upon the other by some wretched-looking houses. Upon descending four or five steps on the left hand, I found four cottages, with a small piece of ground in the front of each, of a few feet in extent, with here and there a sickly looking dahlia, or a consumptive looking chrysanthemum, struggling against premature decay. Proceeding as directed, I entered one of these cottages. I found there a sallow-looking individual, 36 years of age, with a family of five children. Having informed him of the object of my visit, he gave the following account of himself and his earnings:—"I have only two rooms in this piggery—a place not fit to live in. My eldest child is eleven years old, my youngest was born yesterday. My wife is confined upstairs, in the room where the loom is. Three of my children, myself, my wife, and the young *babby* sleep together; the other two children sleep in a small crib by the side of us. I have been obliged to keep the loom at work although my wife is lying there. The noise of the loom has made her very poorly. I pay 17s. 6d. a quarter rent for the place. I am a paramatta weaver, and as the house I live in belongs to my master, I am pretty well employed, more so than the generality of the weavers. I generally work from six in the morning till ten at night in the summer, and in the winter from half-past six till nine o'clock, and when at work I can earn 10s. a week; but then the candles cost me 7½d., and when my wife is not able to do it, I have to pay, for winding the bobbins, 1¼d. a dozen. My average work is about eighteen or twenty dozen in a week. I generally lose two or three days in getting the work, and as much in putting it on the loom. I have been married twelve years, and have had eight children. My wife has got but this one gown. [An old ragged washed-out gown was here produced by an old woman, who attended to act as nurse during the confinement.] She has none but that one to put on when she gets up. Three of my children go to school, and I pay 6d. a-week for them. I am determined to bring up my children as well as I can—I would rather stint myself of food, to give them a little education. It is a mystery to me how ever we get through it. I have been in this wretched way for years, till I am quite sick of it. I went a day or two since to Mr. ———, and his wife gave me some soup on account of my wife being so poorly, and I took a bit of the meat out of it, and, so help me God, that is the first bit of meat I have tasted for months. My children never see a bit of meat, except what they may see at the butchers' shops, as they go to school. Mrs. ——— was kind enough to lend me a bag of linen for my wife, or I don't know what ever we should have done. There are a many of the weavers worse off than myself, because when there is any work to be got I always get the preference. I have always been suffering ever since I was married, and I am never without some trouble; some of my children are always ill, and when some are born others of them are dying. I have only five out of the eight we have had. I have got nothing at the pawn shop, and before I would go to the pawn shop I would lie down and be trampled on. What little I have got I mean to keep as long as I can. For the last five or six years I have not been out of my house except to go to work. I cannot go to church if I would, for I've got no clothes fit to go in. After paying for the candles, the winding of the bobbins, and the 'beaming-on,' I don't think I make more than 8s. a-week. Very often when I go out of doors the fresh air seems to be too much for me, and I often stagger and roll about as if I was drunk." The account of this man's earnings was fully corroborated by a reference to the pay-book of the person by whom he was employed. The furniture and everything about the house was more cleanly and comfortable than might have been expected under the circumstances in which the family were placed.

The next person upon whom I called was a widow employed in weaving gauze—a material which, when dyed, is used as crape for mourning. The house in which she resided was in St. Martin's-lane, in a situation far preferable to many of the others which I had previously visited, and it contained two rooms. In the window of the lower room were a few onions, a few reels of cotton, sweetmeats for children, and other small wares of a similar character. The upper room was occupied by the loom and by the two beds in which herself and family, consisting of three children, slept. The room was miserably close and sickly, and everything bore the appearance of the greatest want and misery. The following is the account which she gave of her condition and employment:—"This is a piece of double super gauze. I get 4s. 6d. for weaving it; when finished it will be about 32½ yards long. It will take me a week and a-half to finish it; sometimes I am a fortnight over a piece; I was a fortnight over each of my last two pieces. I have to play a good deal. I played a week when I got this last 'cane.' My children do the winding, or else I should have to pay for that out of what I get. When I first commenced weaving crape I could earn 14s. a piece. It was a better material then than it is now, and you could do the work a good deal quicker. They have been gradually reducing the pay for it every year, till it is now only 4s. 6d. a piece, if double; the 'singles' are only paid 4s. a piece. The warp and shoot are both silk. I have been a widow eight months; my husband was a pipe-maker, and I was very comfortable when he was alive. He lay ill best part of a twelvemonth before he died, and I was greatly put-to to get on at all. I have five children, three at home, two are married. My eldest son is a pipe-maker at Greenwich; when my husband died, he started off, and took all the things away that he could. I have had one letter from him since he has been away, but he has never sent me any money, although he is in good work, I believe. I get 3s. a-week from the parish—that is, a shilling for each child. I have tried to sell a few things in the shop below, but I can't get on; the people over the way have got all the connection. I bought half a gross of lucifers for a shilling, and I have only sold two of the boxes all this month, and I only got a halfpenny for them. I haven't sold a shilling's worth for more than a week. My constitution is very much broken, and when I do sit up and 'watch' (work by candle-light) I can't earn enough to pay for the candles, and I often think I shall have to give it up and go into the house. I pay 1s. 7d. a-week for rent."

Of all the branches of weaving there appears to be none so wretchedly paid as that of the gauze and crape weavers. Three-halfpence per yard is the miserable amount paid to the weaver for this kind of work—its selling price being from 3s. to 4s. per yard. During the last four months, owing to the large number of deaths from cholera, the trade in this department has been more than usually brisk.

Several of the manufacturers are in the habit of employing persons at Wymondham in the manufacture of gauze and other articles, as they can get the work done even cheaper there than in Norwich. A few years since a large portion of the population of Wymondham were weavers. The failure of a large firm, however, in 1845, was the means of throwing vast masses of them out of employment. Many of them are in the most distressed condition, and are glad to take work at any price. The weavers of Norwich complain sadly of the disastrous effects of this competition for work, which they say the manufacturers are not slow to take advantage of when they wish to make any reductions in their wages.

A case of this kind came under my own knowledge. A weaver of Wymondham was employed to make a quantity of gauze, for which he was to receive 9s. The work had taken him a fortnight to complete, and in order to finish it within that period he had worked from fourteen to sixteen hours per day. It cost him a shilling for a return railway ticket from Wymondham, and he lost a day's time in bringing home the work; he paid 1s. 3d. for winding the bobbins, and used a pound and a-half of "short eights" candles while at work. His account would, therefore, stand as follows:—

	s.	d.
Railway fare to take home the work......	1	0
Winding the bobbins..................	1	3
1½ lbs. of candles	0	7½
	2	10½

Deducting this from the 9s. paid for his work, the net earnings of the poor man for the fortnight would amount to the sum of 6s. 1½d.! I am not aware what was the amount of rent which he paid for his cottage.

Leaving the gauze weaving, I proceeded to inquire into the rate of wages paid for bandannas and silk handkerchiefs. A person who kept a beer-shop in Colnsey-street, used chiefly by the weavers, was employed in this branch of manufacture. Among others, the following answers were given to my inquiries:—"I was last employed in weaving silk handkerchiefs; they were made with cotton warp and silk shoot, and were 33 inches square. I had two dozen of them to make, and by working 14 hours in the day I was able to do 18 of them in a week. I finished the two dozen in ten days, and was paid 16s. for them. Out of that I had to pay 2s. for winding, for 'beaming-on' 4d., and the candles were about 7½d. I paid 1s. 3d. for twisting-in; if I had done the twisting-in myself I should not have been able to have got the job done as soon as I did. All that made 4s. 2½d., which left 11s. 9½d. for myself for my ten days' work I had to play a long time before I could get that work, and I have just got a little job that will take me a week. It is a fortnight since I took my last work home." Nothing, perhaps, would show more strikingly the depressed state of the weavers of Norwich, as compared with former times, than the statements made by this weaver with respect to the amount of the business in connection with the beer-shop. The large room in which the weavers used to assemble to hold their convivial meetings was occupied by the loom. No meeting had been held in it for the last twelvemonths. The sale of spirits would not pay the license, and it had not been renewed for several years. The present consumption of the house is about half a barrel of beer per week, and that only of one sort. The house was formerly the chief place of resort for the weavers, and its former proprietor had managed to save a considerable sum out of it. "They have no money to spend now," said the landlord; "they can't get enough for bread hardly. They used to draw two or three barrels of porter a-week, but the last I had all turned sour long before it could be drawed off."

I was informed that the work which was best paid in connection with the weaving trade was that called the "havel work," which consists in preparing the havel for the weaver. I accordingly visited several of the persons so employed, to ascertain what was the amount of their earnings. One of these workpeople was a woman living two or three doors from widow Smith, the gauze weaver, whose case I have already referred to. Her house was remarkable for the neatness and cleanliness of its interior. She had two children, and her husband worked as a carpenter. "He is a steady man," the wife said, "although he is my second husband, and he is in pretty constant employment. I get for drawing havels for nets, or barèges, 1s. 6d. per 1,800. I can do two of them in a day with my little boy helping me. That, of course, is 3s. a day, when you get it. I pay a girl sixpence a day out of that, to give me the 'ends.' But, Lor' bless you, sir, we play more than half of our time. Since Christmas I haven't played so much as I did before, because we are always busier after than before Christmas. When I have got no work I am obliged to keep my end-drawer, and pay her just the same as though I was in work. If I wasn't to keep her I shouldn't p'r'aps know where to find her when I wanted her. Take all the year round I suppose I can earn 7s. or 8s. a-week, but then you must take the 3s. off that for the girl, and that only leaves 5s. for myself. When the work comes in I am obliged to work a good many hours—a long time after my husband and children have gone to bed. Ah! then there's extra candles and fire—you must reckon them. I can't tell you how much to set down for them, because I don't keep any account." It appears, therefore, that the net earnings of a person employed on the best kind of work are about 5s. a-week all the year round, subject to a charge for extra fire and candles. As this statement was so much at variance with all that I had previously heard on the subject, I resolved to call upon some other person employed on the same work, in order to see whether it would be confirmed. I was accordingly directed to the residence of a person similarly employed. Her statement was as follows:—"I am 21 years old; my father and mother keep a little shop. When about 13 years old, I used to work at Messrs. ———'s factory, where I used to earn sometimes 3s., sometimes 4s. a-week, according to the work. I used to live with my father and mother, and give them 2s. 6d. a-week for my food and lodging. I was sometimes out of work, but not very often. My father and mother, brothers and sisters, all slept together; there was but one sleeping-room. I was sent away from the factory because a young man kept me out all night. Mr. ——— heard of it, and he discharged me, because he makes it a rule not to employ any persons of bad character in his factory. I was seventeen when this happened. I couldn't get any work. I had no money to give my father and mother. I was obliged to have clothes, and I took to learning the havel work. While I was learning, I used to 'go out;" what else could I do? There's many a one obliged to do the same. Why, what's a poor girl to do when she's out of work, and got no money? I have been off and on the street for the last four years. When there's no work I am obliged to do it. I live at home now with my father and mother. They must know that I go out. How can they think I get clothes and money for them if I didn't get it in that way? Don't I earn a good deal at the havel work? Yes, when I am in work I can earn 10s. or 12s. a-week; but then there's half my time I'm doing nothing except the streets. Take all the year round I am sure I don't earn more than 5s. a-week. I wouldn't go in the streets if I wasn't compelled to do it, and then we are obliged to dress nice if we 'go out,' and all I can earn at the havel work goes for clothes."

I next directed my inquiries to the shawl weavers and found one of this class of persons residing in Bull-close, a place formerly set apart for bull-fights: it was a comparatively open space, and much better ventilated than the majority of the residences of the weavers. This person was employed in weaving fancy shawls. With respect to his earnings, he said, "In the course of last year—and I have just been making the calculation from my books—my earnings appear to have been about £30; my expenses were, I reckon, about £5 10s.—the extra rent which I have to pay for an additional room for the loom would be about £1 6s.—the cost of candles would be about 12s. during the whole year, as I have to burn three or four when I *watch;* that would leave my clear earnings about £22. I may say that I stand a much better chance than hundreds of weavers in the town, because when any new design comes out they don't want anybody to see it, and as I am well known to them, I have an opportunity of earning something when the others have not. Very often when I finish a shawl it may not be liked, or some alteration will have to be made in the pattern; and if it is not approved of, I have to take down all my *harness.* When I am what you may call 'going along,' I can earn clear, perhaps, 3s. in the day, but then I don't do that but very seldom. There is no end to the time that is lost in putting the things in harness and altering them. The manufacturer perhaps tells you to shoot it with some other colour, and that takes time to alter the loom. Then there is a great deal of time lost in taking the work home, or in getting other work or orders back. The masters appoint a certain time in the day to receive the work, and unless you can get it in by that time the rest of the day will be lost. Sometimes it takes two or three weeks to put the loom in order, and you are not allowed anything for the loss of time. Sometimes, if you beg and pray of the master, when the pattern doesn't turn out well, they'll give you a couple of shillings perhaps, but that's only as a kind of charity; they won't allow that we ought to get anything for putting the loom in harness."

There is another kind of shawl, called the "fill-over" shawl, for the manufacture of which Norwich is highly famed. I was directed to a person employed upon this kind of work, residing in Silver-road, Pockthorpe, and who was considered one of the most able hands at the "fill-over" weaving, and was specially selected to make one of these shawls as a present to Jenny Lind, at the time of her late visit to Norwich. This person stated that it took him five weeks to prepare what is called the "tow" for the weaving of Jenny Lind's shawl. "The pattern," he said, "took well, and I was employed for three-quarters of a year in making other shawls of the same pattern. I could make about one of them in a week, and I was paid 24s. 10d. each for making them. Out of that, I had to pay the 'winder' 2s. 6d.; for 'shoppage,' or hire of loom, 2s. 6d.; a 'tire-drawer,' a boy to pull the tires while weaving, 7s.; for 'picking,' 6d.; and at night I had to have three candles going at a time, which would cost about 1s.; the whole expenses would, therefore, be 13s. 6d., which would leave me clear 11s. 4d. for my week's work. Miss Lind was very kind to me, and so she was to every one who made anything for her. She sent Miss ——— round to all that she could find, and gave 'em all anything that they wanted. When she came to me I said I didn't want anything; I thought it would be imposing like upon her, but Miss ——— said, 'You must have something; then my daughter said, 'Father, I think you want a good greatcoat;' so Miss ——— sent a tailor to measure me for one, and she paid for it, and I hadn't had one for a many years before that. Miss Lind did a world of good for the poor weavers when she was here, and they all adore her for it." I visited several other "fill-over" weavers, and found that the amount of their earnings was about the same as that already stated. One of them stated that he was out of work five months out of the year; another had "played" three months out of the last four; and a third said that he was out of work half of his time. There appears to be every prospect of a large amount of employment in this branch of weaving for the next four months, as I was informed that the Norwich manufacturers "were determined to put an end to the reign of silk and velvet mantles, polkas, and visites, which had for several years been so injurious to the shawl trade."

Where there is such an enormous amount of unemployed labour, it will very naturally be expected that the poor-rates are proportionately high. The rate for Michaelmas, 1848, was 1s. 7d. in the pound; for the corresponding quarter of this year it is only 1s. 2d., the amount ordered for the quarter being £7,200; of this sum about ten per cent. would remain uncollected. Last year there were as many as 13,000 persons at one time on the relief lists of Norwich, being nearly one-fourth of the entire population of the city. When the weaver is out of employment, his only resource is the workhouse; but here he is met with the greatest difficulty. The authorities of Norwich have calculated that a weaver can exist fourteen days without work before he will require relief—or, in other words, that the price which he gets for his work when taken home will be sufficient to maintain himself and family for the following fourteen days—strangely forgetting that the work for which he may be paid has taken him perhaps a week or a fortnight to make. By far the most rational and correct conclusion to come to would be, that the amount which he receives for his work would be required to defray the expenses of maintenance incurred while the work was in hand, rather than that it should be available for future support. The board of guardians of Norwich do not, however, view the matter in this light. When the weaver applies for relief to the board, he is furnished with a certificate, of which the following is a copy, which he has to get filled up and signed by the party who last employed him.

"TO THE RELIEF COMMITTEE OF THE CORPORATION OF GUARDIANS.

"Norwich, 184

"The bearer has not worked for me since the day of when he received shillings and pence.

"This certificate is not to be used as a begging petition."

If upon the production of the certificate it is shown that the applicant has practically solved the mystery of a weaver's existence for fourteen days without work, he is handed over to the superintendent of the weaving rooms in connection with the workhouse, and forthwith, after existing fourteen days without work, he is set to weaving; and if he has a wife and one child, he may earn at weaving 6d. in the day, for which he will be paid at night, when his work is completed. According to the number of his children will be the proportion which he will be allowed to earn; if he weaves more than the given quantity he is not paid for it, and if he earns less he gets nothing. The workhouse at Norwich is totally inadequate for its purpose. It will only accommodate 355 persons, and the guardians consequently contrive to make the labour test, in connection with the fourteen days' non-employment, a substitute for the workhouse test.

It is only very lately that the guardians would sanction the system of giving employment to the weavers at all. The consequence was, to use the words of my informant, "the place was literally eaten up with paupers, who were constantly receiving out-door relief." But the means of giving employment to the weavers, even upon the present system, are miserably deficient. The great majority of them are receiving out-door relief, for there is no room for them in the workhouse, and when once they get upon the lists they have no inducement whatever to obtain work, as it is always precarious and uncertain; and if they should succeed in obtaining any, if only for a week, or some other short time, they know that they will not be able to obtain relief until they have again been fourteen days without work. One of the guardians, speaking to me upon the subject, said, "that although it was a saving to the rate-payers, still the benefit would be derived by the poor themselves, from the extension of the system upon an improved principle; and the giving of increased accommodation in the workhouse would be infinitely better, as it would have the effect of diminishing the enormous amount of idleness and vice which was inseparable from the existing state of things in Norwich." Owing to the smallness of the workhouse, it is impossible to carry out anything like an efficient system of classification among the paupers. The young, able-bodied, and the old men are found together in the same ward; and women of abandoned character are placed in the same ward as the virtuous and better class of females. In fact, the Norwich workhouse presents a vast number of those repulsive features which were so common to establishments of this kind previously to the passing of the New Poor-law. By one very numerous class of females it is invariably used as a lying-in hospital. Upon the occasion of my visit to the house, as the females were passing in to their dinner, the master pointed out several of them to me who had been in three, four, five, and one even six times, for the purpose of being confined there. The influence which the association of such persons exercises upon the better class of females is almost incredible. Numerous attempts, I was informed, had been made to obtain increased workhouse accommodation, and the subject had been repeatedly brought under the notice of the guardians; but hitherto all these efforts have been unsuccessful, as it is invariably treated as a party or political question. I send a copy of the dietary table, from which it will be seen that at all events insufficient diet is not one of the grounds of complaint:—

	Breakfast.				Dinner.							Supper.				
	Bread.	Cheese.	Treacle.	Tea.	Meat.	Yeast Dumpling.	Potatoes.	Suet Pudding.	Bread.	Cheese.	Pea Soup or Milk Broth.	Bread.	Cheese.	Butter.	Tea.	Meat Broth.
	oz.	oz.	oz.	pint.	oz.	oz.	oz.	oz.	oz.	oz.	pints.	oz.	oz.	oz.	pint.	pints.
SUNDAY.																
Men	6	1	..	½	..	..	..	16	..	..	..	6	..	½	½	..
Women	6	1	..	½	..	..	..	14	..	..	..	6	..	½	½	..
Boys from 9 to 16 years of age	6	..	¾	½	..	..	..	14	..	..	..	6	¾	..	½	..
Girls from 9 to 16 years of age	6	..	¾	½	..	..	..	12	..	..	..	6	¾	..	½	..
MONDAY.																
Men	6	1	..	½	..	..	..	..	6	1	..	6	..	½	½	..
Women	6	1	..	½	..	..	..	..	6	1	..	6	..	½	½	..
Boys from 9 to 16 years of age	6	..	¾	½	..	..	..	..	6	¾	..	6	¾	..	½	..
Girls from 9 to 16 years of age	6	..	¾	½	..	..	..	..	6	¾	..	6	¾	..	½	..
TUESDAY.																
Men	6	1	..	½	4	5½	12	..	..	..	..	6	..	..	..	2
Women	6	1	..	½	4	5½	12	..	..	..	..	6	..	..	..	2
Boys from 9 to 16 years of age	6	..	¾	½	3	5½	8	..	..	..	..	6	..	..	..	2
Girls from 9 to 16 years of age	6	..	¾	½	3	5½	8	..	..	..	..	6	..	..	..	2
WEDNESDAY.																
Men	6	1	..	½	..	..	..	..	6	..	2	6	..	½	½	..
Women	6	1	..	½	..	..	..	..	6	..	2	6	..	½	½	..
Boys from 9 to 16 years of age	6	..	¾	½	..	..	..	..	6	..	2	6	¾	..	½	..
Girls from 9 to 16 years of age	6	..	¾	½	..	..	..	..	6	..	2	6	¾	..	½	..
THURSDAY.																
Men	6	1	..	½	4	5½	12	..	..	..	..	6	..	..	..	2
Women	6	1	..	½	4	5½	12	..	..	..	..	6	..	..	..	2
Boys from 9 to 16 years of age	6	..	¾	½	3	5½	8	..	..	..	..	6	..	..	..	2
Girls from 9 to 16 years of age	6	..	¾	½	3	5½	8	..	..	..	..	6	..	..	..	2
FRIDAY.																
Men	6	1	..	½	..	11	..	..	..	..	..	6	..	½	½	..
Women	6	1	..	½	..	11	..	..	..	..	..	6	..	½	½	..
Boys from 9 to 16 years of age	6	..	¾	½	..	11	..	..	..	..	..	6	¾	..	½	..
Girls from 9 to 16 years of age	6	..	¾	½	..	11	..	..	..	..	..	6	¾	..	½	..
SATURDAY.																
Men	6	1	..	½	..	..	..	..	6	1	..	6	..	½	½	..
Women	6	1	..	½	..	..	..	..	6	1	..	6	..	½	½	..
Boys from 9 to 16 years of age	6	..	¾	½	..	..	..	..	6	¾	..	6	¾	..	½	..
Girls from 9 to 16 years of age	6	..	¾	½	..	..	..	..	6	¾	..	6	¾	..	½	..

It is pleasing, among the many unpleasant things connected with Norwich, to witness at least one institution which has already produced an incalculable amount of good—and that is the "Boys' Home." The object of this institution is to afford a home for the workhouse boys, entirely removed from the contaminating influences of such an establishment. A house has been taken and fitted up at a short distance from the workhouse, where the boys are fed and lodged, and to which they return at night from their various occupations in the city. Each boy gives a portion of his earnings for his food and lodging, and even with the small amount of support it has already obtained, the receipts from the boys are sufficient to cover nearly the whole of the expenses. The institution owes its origin to Mr. Bailey, the workhouse schoolmaster; and the account which he gave me of its rise and progress was as follows:—

"I was appointed schoolmaster in November, 1842. I found the children at that time in very great ignorance, there having been no schoolmaster previously. After I had been engaged about six months I asked the chairman of the school committee whether he would permit me to take the children out for a walk. He referred me to the school committee, who were rather fearful that I should lose some of them. I promised I would keep a vigilant eye upon them, and by promising to repeat their 'frolic' (as some of them called it) if they behaved properly and orderly in school—and, to the best of my recollection, I never forfeited my promise—I gained their confidence in a great measure, and began to think there was some hope of reforming them, and ultimately of their becoming good members of society. In order to test this, I selected a boy of about sixteen years of age, into whom I thought I had instilled a little morality. I asked him whether he would prefer being employed out of doors, or still continue an inmate of the house? I saw a smile and a doubt upon his countenance as he replied, 'I'm fearful you are laughing at me, sir.' I said, 'Henry' (for that was his name) 'do you ever remember my doing such a thing as that?' He said, 'No, sir.' I took no further notice at the time to him about it, but called upon the chairman of the school committee, and submitted to him my plan, which was this: I proposed to find the boy lodgings with some respectable poor person, if the committee would allow me 1s. 6d. a week, to assist him to pay for linen and lodging. This, through the influence of the chairman, they granted. The result of the experiment has been, that the boy has never been an inmate of the workhouse since. I found, upon making my intentions known among my friends, that I could find more places for my boys than I could provide lodgings for. Upon my again applying to the same gentleman he immediately took the necessary steps to provide a home for them. The following are the results:—Fifty boys have been admitted, of whom two only have returned for bad conduct. Some of these I have ascertained, are earning from 10s. to 12s. a-week, others are living as indoor servants, and, I am happy to say, retain their places with good characters. Some few have left Norwich."

I might add that the boys whom I saw were all looking remarkably well; their sleeping apartments were well ventilated, clean, and comfortable, and their diet was both good and substantial.

Many of the low lodging-houses of Norwich are of the most disgraceful character, I visited several of them—some during the day, others at night. One, which I visited during the day, was a public-house. The house itself was in the most wretched state of dilapidation; one of the windows and frame were entirely gone from the staircase, and as you ascended the rickety and crazy stairs some care was necessary to avoid falling through the large space which was thus left open in the walls. In one of the rooms, used as the sleeping room, were six beds, and a "shake-down" or two on the floor. The window of this room was broken in several places, and old pieces of paper, rags, and other materials were used to stop up the holes. The adjoining room to this was occupied by the landlady, who, I was informed, was gone to London for a few days, on particular business. Two other beds, besides that of the landlady, were in this room, and in one corner, on the floor, I observed what seemed to be another bed. Above these rooms was an extensive loft, extending the whole length of the building, the access to which was by means of an old ladder. Upon inquiring, I was told that no person ever slept there, for the end of it had fallen away, and the roof was in such a state as to leave it entirely exposed to the weather. As I could not exactly reconcile the fact of the ladder being there with the statement that it was never used, I ascended into the loft to see for myself. So far as the condition of the place was concerned, it was worse even than the description which I had heard had led me to suppose. Upon going to the further end of the wretched place, towards what I at first thought a heap of rags, I was surprised to see some movement among them, and upon approaching somewhat nearer, I found to my astonishment an old woman lying there. Upon announcing my discovery to the daughter of the landlady, she feigned to express considerable surprise, and after a short pause, she recollected that "there was an old woman went up there the day before yesterday, but she thought she was gone." In the bed-room with the six beds a young tailor was sitting at work, making a pair of boy's trowsers, for which he was to get 3d. He had been in the habit of sleeping in the room, off and on, for the last three or four years, and he appeared perfectly astonished when I asked him whether there was any separate apartment for the women. His reply was, "Lor,' no; we all sleeps together here; last night there were fifteen of us in all—three married men with their wives, and the rest of 'em were single chaps and any girls they liked to bring with 'em; for the landlady wasn't at all partikler in that respect, though she tried to get another 3d. out of 'em when such was the case. Sometimes, when there's a married woman at all nice in that way sleeping here, she hangs some of her clothes on a line across the bed-post; but we don't have much of that here." The daughter of the landlady informed me that when one room was full, her mother let out the beds in her room, and very often a part of her own bed, and "was noways partikler who it was to, so long as they paid." The back part of the premises was in the most filthy state. There was no privy to the place; a large hole dug in the ground formed the receptacle for the refuse and filth of the house; while nearly the whole surface of the yard was covered with night soil.

The other house of this description which I visited was also a public-house. I visited it on Sunday evening, as I was informed that there would be more "company" there then than on any other night. Upon arriving there, I was shown into the sitting room of the tramps and travellers. It was a small room, about ten feet square, in which was a very large fire, and, seated in two rows upon each side of the room, were 25 persons. male and female. The heat, smoke, and close smell of the room were almost overpowering; and a gentleman who accompanied me was obliged to leave almost immediately. Upon inquiring of them I found there were among them persons from the following places:—Liverpool, 2; Hereford, 2; Newcastle, 3; Derby, 2; Norwich, 1; London, 4; Manchester, 2; Salford, 1; a Dutch girl from Holland, who sold brooms; 2 from Essex, 2 from Ireland, 2 from Scotland, and 1 from Cornwall. The total amount of money which they had was 1s. 7¼d. Of the number present twelve had none; one had a farthing; three, a halfpenny; four, a penny; one, five farthings; two, three halfpence; one, twopence; and one, twopence three farthings. Four out of the company could read and write; five could read, but not write; the remainder could neither read nor write. I then inquired how often any of them had been in prison for any offences?

"I was in once for a week for begging," said a young urchin of ten years old. "I was lagged for poaching, and got two months for it," said another. A boy of sixteen years old said, "I had six weeks of it on the wheel once, and another time I had a month without it." "I had seven years over the water," said a somewhat elderly man from Liverpool, "but I didn't leave old England, and arter three years I got my discharge." "I can't tell you how often I've been in," said a desperate-looking character who sat in the corner; "they've had me so often I begin to think they won't have me any more. Last time I was in London I got a month for a 'winder' job, for I am a deuced sight better off in *quod* than out of it." "You're quite right," said a thin and sickly-looking man who was sitting next to him; "a *pal* tramped along with me from Ipswich yesterday, and he said, says he, 'Jim, what's the best thing to get a month for?' I recommended the *winders*, and he said he'd do it; and as he's not come here to night I s'pose he's better off." "I have been," said another person, who from his peculiar deformity was called my lord, "in almost every gaol in England, and I could tell you some queer things about some of 'em." "Well, I've not been in anywheres yet," answered another, a broken down respectable-looking person, "but I don't know how soon I shall be there, if I don't get something to do soon; I can't go on for ever like this." "Nor I haven't either," said a young, stout, and determined-looking character, "but if I can't get something to-morrow, blow me if I don't do something to get in." "They had me up once for singing in the streets, and gave me seven days for it," was the answer of another, who, in answer to my question, said that he was a ballad-singer. "I sings 'em and sells 'em, but the cursed blues won't let a fellur get a honest living now-a-days. As soon as you jist tip a stave, up they comes bouncing, and says, 'You musn't make that noise there,' or calls the singing some other disrespectable name. Lor', in my earlier times, I've made lots of money. You knowed Greenacre, I s'pose? Well, what do you think I made out of his dyin' speech? Why, twelve bob. I came down from London with a lot of Mannings, but somehow they didn't go so well as I expected. I don't think the people have got so much money as they used to have." "I've never been either in a prison or a workhouse yet; and, please God, I never will," said a journeyman carpenter. "I've seen better times, and I hope and trust I shall see 'em again." None of the other persons had been in prison, but four of them had occasionally received parish relief.

I found upon further inquiry that ten of the persons present had not paid their lodging for the night, and had not the means of doing so—twelve of them had had nothing to eat since breakfast—one had had a piece of bread given her by a fellow tramp—five had had some bread and cheese for their dinner—one some bacon and bread—and two (a husband and wife) a herring and some potatoes. One of the women, who was married, was nursing a weak and starved-looking child, of about ten weeks old. The little creature, as it lay upon the mother's lap, frequently gasped and started convulsively; its breathing was short, and a distressing and gurgling noise appeared to come from its throat, as if on the point of death. During the time I remained in the room, I suffered considerably from the oppressive and heated atmosphere, and had several times to request the door to be left open. The sufferings of the child must have been intense, seeing that it had been in the confined room during the whole of the day. I asked the mother if the child was ill; she said it was very ill, and with apparent unconcern, "she didn't think it would live long, it wasn't a healthy child from its birth." I asked her how many children she had, her answer was "five as counts." Upon desiring to know why the others were not entitled to some consideration in the reckoning, she said "the first never counts for nothing—my husband acted on the old saying about here, 'No child, no wife,' and I had one afore I was married." There were three sleeping rooms in the house, containing together seventeen beds, most of them placed side by side so closely that there was not room to pass between them. They were much cleaner than those I had seen previously; but here, as at the other place, "they were no ways partikler" about the separation of the sexes—not the slightest attempt being made for that purpose.

CALENDAR OF HORTICULTURE.—APRIL.

Retrospect.—It will be perceived by referring to the meteorological diary that the weather has been very motley, and upon the whole cool beyond the average since the closing date of the March calendar. The nights have been generally frosty, just to such a degree as to produce rime upon the herbage, but rarely a film of ice, excepting on the two last days of February and the 1st of March; the days were much warmer, the wind perpetually veering in all directions. Vegetation has therefore been checked, and in some instances the young shoots of the roses, laburnums, and the like, which were precociously forward, have been touched, and rendered brown. No other injury has, to appearance, been done. Wall-fruits have been timely retarded, for the decline of temperature occurred before the blossoms could expand; these are numerous, if what come under my observation be a guide, and if the weather remain cool will not be unseasonably early. Hot sun after rimy nights, is most to be dreaded.

Vegetable Department.

Sow within the first ten days any or all of the following varieties of broccoli, in beds, or rows separately, marking each; use rich light loam.

1. Grange's early cauliflower, to come in the autumn from Michaelmas.
2. Knight's protecting, for February and March (it is now beautiful).
3. Large-headed purple, for March and April.
4. Portsmouth cream colour, the heads sometimes two feet or more round.
5. Chapple's cream, for May, a fine flower, and sometimes large.
6. Miller's dwarf, for May, very hardy in the winter.

If birds threaten, stretch flossy coarse worsted above the seed rows, and place a bird or two (its feathers made rough), suspended by a line from a pliant twig, as a token; which, however, the chaffinch is apt to overlook.

Sow also Brussel's sprouts, savoys, borecole, cabbage for succession, and cauliflower; carrots, purple small beet, white beet, parsnip, for full crops; also, if wanted, salsafy, scorzonara, and skirret.

We have more than once said that carrots should have a light and sandy loam, free from stones, roots, or other impediments to their perpendicular tapping downward. Hence the Surrey carrots are always the best in figure and cleanness of skin. All the other spindling roots do well in stronger loam, manured a foot below the surface. Sow the seeds in shallow drills one foot asunder. Sow stone turnips now, and twice again in the course of the month.

Asparagus beds, finish the forking immediately, and if it appear that the shoots are not stirring, but lie safe under an inch of soil, salt may still be tried without danger, particularly if a two-inch layer of leaf-screening be added before the salt.

Artichoke suckers, if well-rooted, should be slipped off carefully, and planted in prepared beds, 30 inches to a yard plant from plant; water from time to time if the weather prove dry.

Peas, the larger kinds, Imperials, and marrowfats. Let the later sowings of this and the following month be prepared for in the following judicious way, which I think surpasses that of the late Mr. Knight—" Instead of sowing in drills, select a spot where celery grew. Dig trenches nine or ten inches deep, and put in fermented dung to half the depth; press this even, and on it add fine earth to the surface level. After a day or two sow the seeds one by one regularly, and cover with earth. The vigorous growth thus produced will completely defy the mildew, which is the bane of peas after a dry summer" (Gard. and Nat. Calendar, April).

Earth up and stake peas of the earlier sowings.

Potatoes can be set during the month.

Celery: prick out young plants of equal growth four inches apart into rich light earth, and sow more seeds for late supply.

Sow and plant out *lettuces* in rich soil. These may be set between rows of peas sown widely apart. Lettuces require supplies of water abounding with such soluble matters as exist in the rills and brooks that are seen in the London market gardens, and by aid of which those fine vegetables are raised that few persons can compete with.

Blanch *seakale* by covering with pots or boxes. This plant prefers light soil three to four feet deep, and if manured with decayed sea-weed—as it may be near the coast—it will be all the better. Form beds five or six feet wide, made deeper by throwing up the earth from a twelve-inch wide trench on each side cleared to the subsoil. If the earth be naturally heavy, its texture and depth can be improved and increased by a good quantity of sea sand, or, in its place, river ballast, incorporated during the digging. Salt may also be added to the latter to bring it more to the condition of sea sand. Sow the seeds of the kale in two rows equidistant from each other and the edges of the trenches. More of this at its season.

Parsley, sow plenty of the best sort (Ayres' curled giant is esteemed), fennel, borage, thyme, sweet basil; but the sweet *pot-herbs* are most quickly raised by slips of last summer's shoots set three or four eyes deep in a shady place, as a nursery bed; thus, sage, lavender, rosemary and baum, mint of all kinds, lemon thyme, and all things else that form rooted shoots or runners, can be removed to suitable places with certain success.

Hoeing, hand-weeding, staking, and every operation of routine, must be attended to.

Sow kidney and runner *beans* about the 21st thickly in pans or boxes; keep under cover from rain and frost; they will soon germinate, and nothing can transplant better. In the warm dry weather of May the plants can be taken to the open ground, where they are to remain.

Hardy Fruit Department.

It will be full early to think of any disbudding, even in the last week; but on every tree infested with green fly, eggs of insects, mosses, or lichens, the sulphur and lime wash, with or without infusion of tobacco, might be used effectually. *Grafting*, especially by " the crown" or rind, will yet succeed with the later kinds of apples and pears. Plums do much better with budding in the summer; so do apricots, peach, and nectarine stocks. I plainly perceive that a great deal of fine bloom, and consequently more fruit in proportion, will be obtained by a judicious foreshortening of the laterals and fore-rights of the stone-fruit wall trees.

FORCING DEPARTMENTS.

Pines.—In the fruiting house, after any of the plants have bloomed, remove every useless sucker, retaining only the best, if wanted, and support the fruit, as required, by a stake and tye. Keep the heat (with air) on sunny days to 90 deg., and by night to 65 deg. Shade succession plants with a canvass screen, but only for a few hours of the brightest days; general heat as above. If planted out, and not in pots, we find, upon good authority, that "when once fairly established in the free soil they will soon outgrow their potted companions, and their broad leaves and dark colour will then show that they are in comfortable quarters." As pines take root so freely in what is called peat (that is to say, the moor soil in which heaths delight), I suggest that the compound for beds to grow pines without pots, in house or pits, heated by warm water, or by dung linings, and hollow chambers, should consist of two parts such heath mould and one part of perfectly decayed couchgrass roots, harrowed from a free-working mellow loam. If dung be used let it lie in layer below the bed of incorporated soils. This compost is admirable for cucumbers in pots or similar warm pits. It is too weak and loose for melons, which generally prefer a pure unctuous loam or chopped turf, as by Mr. Knight's practice.

The *Peach* house or pit requires assiduous care to obviate and destroy aphis by fumigation; also to guard against rapid advances of solar temperature, never allowing that by fire to rise above 55 deg. Air admitted early will regulate the former, assisted by a screen after 10 a.m., and during the most sunny hours.

Vinery.—The atmosphere (if hitherto moist and vaporous) must be made more dry when the fruit begins to colour. I have on several occasions alluded to Mr. Williams' (of Pitmaston) rejection of vapour and syringe. Every one to his object. Some prefer flavour to bulk of fruit. As to the "red spider"—black, it ought to be called—sulphur and lime painted on the hot water pipes may, perhaps does, tend to remove the pest. So may the steam of a vapour bath. I never saw it in my houses, nor that more recent malady—mildew. Hence, I am not prepared to advise. Under glass, and in the open air, numerous instances of a crop of grapes ruined by mildew were observed last summer, and the *Gardeners' Journal* had many articles on the subject. Sulphur was referred to as the remedy; but in all cases where the air contains and deposits the peccant matter, invisible and unsuspected, who can effectually interfere?

SHRUBBERY AND FLOWER GARDEN.

Evergreens can be planted early in the month, but great care must be taken to expand their delicate roots, and to see that fine earth touch every fibre, giving a good supply of water at the time. Stakes in some cases must be so placed as to steady the tree without abrading any of the roots. Every species and variety of hardy *herbaceous* plants may be introduced, or divided, and placed in a proper situation. New soil should replace the old, if the finest display be hoped for, especially where bedding out in masses is contemplated. The parterres should thus be prepared for, while the stock of scarlet and variegated pelargoniums, verbenas, petunias, and other delicacies, are being protected, yet hardened, under glass. It is to be regretted that some of our brave old flowering plants should be generally discarded for novel annuals; but "fashion" is the leader and "the foe." Weigela rosea, finely figured in *Paxton's Magazine of Botany*, vol. xiv., p. 248, is one of the finest hardy shrubs lately brought from China. The Dianthus tribe, in all its varieties of pink, carnation, clove, &c.; stocks, particularly the new German varieties; Lysimachia linum, columbines, larkspur, above all the deep blue Delphinium superbum, are a few among the thousand beauties which are at ready command.

Roses, standard and dwarf, are deservedly prized; they can be forced in pots, or treated as being completely hardy. But in the garden the soil ought to be a deep turfy loam, incorporated with mellow stable manure. Pruning, according to the habits of each class, is an operation of judgment at all times, but of peculiar nicety in the present fitful season. Frosts, slight and transient as they have been, have disfigured many of the precocious shoots of established trees, and the starting buds of stocks "worked" in August last more than the steady rigour of ordinary winters. Final regulation should therefore be deferred for ten days, *i. e.*, till the first days of April, remembering then that the trees of trailing habit, as Jean Despretz for a type, ought to have a regularly open head, its main shoots little curtailed, but left so that they may lengthen into graceful curves. The Bourbons, Perpetuals, and Noisettes, now the favourites, should be kept centrally open, but so pruned that each shoot may expand, and yet retain its true angle without contortions and ungraceful bends. The old once-blowing varieties and moss roses, should be pruned to from three to five eyes, true to the direction of the shoots retained.

FINAL REMARKS.—These will be prospective in the present instance. The vernal equinox, *i. e.*, the apparent entrance of the sun into the ascending sign Aries, occurred this morning (21st) at 4 h. 56 m. The wind southerly, rising to a fresh breeze, as it has done ever since the established south-west currents brought in that great abundance of rain which has fallen within the last six days. The prognostics, therefore, are those of a windy and showery summer. If steady and gusty winds from our wettest quarter—if double strata of clouds, the lower consisting of dingy grey masses, moving more rapidly than the dense white cumuli above them, and a steadily falling barometer, be tokens worthy of attention, then, connecting them with the critical nature of the period, and the great paucity of rain during the 15 previous months, I venture to caution the gardener, and beg him to be prepared for a very arduous season to come. Labour, weeds, and moluscous vermin, if the result do not prove a rare exception, will fall to his lot, and task his assiduity. J. TOWERS.

Croydon, March 21.

OPERATIONS FOR APRIL.

Flower Garden.—The weather has been unfavourable for the prosecution of many of the most important out-of-doors operations; and most of the directions given last month will be equally applicable now to maintain that appearance of finish and high keeping which is expected at this advanced season.

Herbaceous Garden.—The necessary digging up and regulating the beds of these plants must be vigorously proceeded with in fine weather. Mark the situation of all newly planted things, that their position may be ascertained at any season; in the case of bulbous plants, which require to be left in the ground, it is very necessary. Attention to minutiæ of this kind in detail, not only in the present instance, but in all the work of a gardener's hands, constitutes one of the principal elements of success in the aggregate, and eminently distinguishes the pains-taking from the careless man. Yet how many there are who aim at great results by a *coup de main*, as it were, forgetting that mountains can only be climbed by single steps.

Annuals.—The tender annuals sown last month must now be potted off or pricked out, in order to bring them forward for final transplanting. Many persons defer sowing until this month, and then plant out at once from the bed; but plants thus treated seldom flower well until very late, when they are frequently cut off in the midst of their beauty by early frosts. I, therefore, strongly recommend sowing early; and never to neglect pricking out or potting in light sandy soil before being planted in the open ground.

Bedding Plants.—Propagating for the main supply of these plants should now be completed, and the whole potted off and passed through the several stages of hardening off as soon as possible. The rooted cuttings of dahlia must be potted off and prepared for hardening as soon as possible; the choicest sorts of dry roots should also be potted immediately, and the commoner sorts for border and shrubbery work may be planted out at once. Plant beds and patches of Tigridia pavonia and conchiflora.

Rose Garden.—Towards the end of the month Tea-scented Noisette and other tender sorts may be planted; also any which have been laid in for safety during the winter may now be brought out and planted. Use plenty of decayed manure.

Rock Garden.—Give each little *plateau* and sheltered nook a modicum of fresh soil. The different varieties of hardy heaths which flower late in the year should be well cut back and kept in shape; Menziesia polyfolia bears cutting back very close, and flowers gloriously in the autumn. The different sorts of Helianthemum should also be nicely trimmed into shape.

Shrubberies.—Evergreens may still be planted; but the sooner this sort of work is over the better, as the borders where they are in sight should now be neatly raked and the edges nicely cut. Box edgings may also be planted. Gravel walks should be turned, a little fresh gravel added, and the whole kept well rolled.

CONSERVATORY.

Where there is a good stock of Azaleas, Rhododendrons, Camellias, and Acacias, this house will now be in a blaze of bloom, with very little assistance from the forcing house; However, where variety is an object, recourse must be had to the forcing house for the smaller things, such as Roses, Pelargoniums, Cinerarias, Pinks, Heliotropes, and Ageratums. Most of the climbers will now require thinning and training. Amongst Azaleas it will be found there are many in cultivation of a dull, undecided colour: all such ought to be discarded at once. Look well for green-fly on all plants making growth, and fumigate directly they appear.

STOVE.

If the general collection here was potted in February, they will now be growing freely, and towards the end of the month probably some of the strongest growers will be in a condition to take another shift. Clerodendrons should now be stimulated as much as possible, by being plunged in a brisk bottom-heat; and if they have good broad leaves to take it up, give occasionally a good supply of manure. Allamandas, Stephanotis, Dipladenias, and Schubertia graveolens, should also be encouraged by the same means. Keep good fires, so that air may be given on all favourable occasions.

GREENHOUSE.

Give a good shift to a few strong plants of Campanula pyramidalis and fragilis, and place them in a cold pit till they have made some roots. Put in cuttings of new Chrysanthemums; but the old plants, shaken out, repotted, and grown on without being stopped, make the best flowering plants. They will grow taller than plants that are stopped; but for a conservatory, where they stand on the floor, this is no great fault.

KITCHEN GARDEN.

Hardy Fruits.—Newly-planted trees should have a few inches of decayed tan, rotten leaves, or decomposed manure laid over their roots. Defer cutting back young trees from the nursery, whether maiden or trained, till the roots are active. This operation should not be performed before May. Disbudding peach and apricot trees should be commenced when out of flower, or, at least, so soon as the shoots are an inch and a-half long. Use every means to secure a successional supply of young shoots from the bottom of the tree, and to replace deficiencies that may arise from disease or exhaustion. *Strawberries.*—Although the month of April is not the time we would choose for making new plantations, circumstances may have prevented their formation during last July or August, and, in that case, the present month is as favourable as any. Planting in rows, from two-and-a-half to three feet apart, is more convenient than beds for the purpose of cleaning, manuring, and gathering the fruit. *Grape Vines* on the open wall seldom pay for the space they occupy, and just because too little attention is given to their management; but, if the same amount of care were bestowed on the preparation of a border, the planting suitable kinds, pruning, training, and stopping, as is practised in vine houses, they would afford full remuneration for the care. Wall culture is the only resource for the majority of amateurs; and the defeats they so often experience, do not arise from the want of anxiety, but a deficiency of practical knowledge. *Fig Trees* may now, with safety, be uncovered. The fan method of training is the best, as the trees can be kept in a more fruitful condition than when trained otherwise. They fruit abundantly in a deep loamy soil, not highly manured, but well drained

Vegetables.—*Peas* should be sown at once, to succeed those of the middle of last month. The kinds may be Auvergne or Fairbeard's Surprise. The height of each is from four-and-a-half to five feet. On the fifteenth of the month sow Victoria or Knight's Tall Marrow. *Broad Beans.*—Plant the Long-pod variety in drills three feet apart, and six to seven inches between each seed. *Cauliflowers* preserved under hand-glasses during winter must have the surface-soil slightly stirred, and a little added to their stems to keep them steady. Plants raised in heat during January or February ought now to be ready for final transplantation; a space of two feet or more is necessary between each plant. *Onions* sown last September should be planted on ground well-manured, dug deeply, and broken finely with the spade. *Early Horn Carrots* should be sown to succeed those of February. Select a porous soil, and of a rather poor character. *Celery* for the last crop may now be sown in a warm corner of the kitchen garden or cold frame. Cole's Superb Red is a hardy good flavoured kind. *Red Beet*, for a principal crop, should be sown from the first to the middle of the month. Choose a poor piece of ground, for a rich soil gives it a gross habit and destroys the red colour. Sow it in rows sixteen inches distant, and make the ground firm, if dry. The White Variety is cultivated as a substitute for spinach, and the mid-ribs are stewed in winter, and eaten like asparagus. *Kidney Bean* sowing should be deferred till the last week in the month, except in very dry and warm situations. A few may be sown in heat, for transplanting. *Leeks* sow at once, in highly-manured soil. *Spinach* and *Radishes* sow between the rows of peas, once a fortnight. *Turnips*, to grow them juicy, demand a liberal supply of manure, and plenty of water, for when fibry they are worthless. The Snowball and Preston are suitable varieties to succeed the Early White Dutch. *Cardoons* sow in trenches similar to what are used for celery. Lay in the bottom of the trench dung eight inches deep, and cover it with a couple of inches of soil, and deposit two seeds ten inches apart in each place, in case of failure; but reduce them to one plant when a few inches high. *Seakale* shoots should be thinned sufficiently to admit light among the foliage; for without the crowns are properly matured, it is needless to expect a profitable return when the forcing season arrives. *Salsafy* and *Scorzonera* should not be sown before the last week in the month or the beginning of May. Prepare a piece of ground in an open situation for the reception of the following seeds. They should be sown shallow and thinly. To prevent the depredation of birds, lay over the beds a few thorn branches. *Broccoli* should be sown on the first and middle of the month. Granger's White for early use; Mammoth, Chapple's Cream-coloured and Malta for autumn crops. *Savoys* for October and November should now be sown: the Dwarf Green curled is a good variety. *Brussels Sprouts* may be sown at the beginning and end of the month. *Cabbage* sowing should be continued occasionally. Nonpareil or Shilling's Queen is good for summer crops. *Salading* should be sown on warm border every ten or twelve days. *Nasturtiums* for pickling to be sown in drills three feet apart, and supported with pea-sticks, and they will continue to flower till destroyed by frost. *Capsicums* and *Love-Apples* should be placed in small pots when a few inches high, and put in a slight heat till they begin to grow, and gradually subjected to a cool temperature before being transferred to the kitchen garden walls. *Cucumbers* and *Vegetable Marrows* should be sown, if not done last month. *Basil* should be sown at different times, as the early plants are liable to be destroyed by damp. *Marjoram* may be sown any time during the month, and afterwards transplanted into rows. The herb ground, among other multifarious duties of the month, must not be forgotten. *Mint* will thrive in almost any soil, so that it is not too wet; but light earth suits better. *Sage* is propagated by cuttings, but the autumn months is preferable to spring. *Thyme* procured from seed sown on light soil or from cuttings. *Tansy* and *Tarragon* are propagated from division of the roots. Clear off all vegetable refuse. Prepare ground for successional crops. Space, now or lately occupied with broccoli, savoys, and borecole, will come in for peas, beans, celery, and turnips.

THE WEATHER.—At a recent meeting of the Edinburgh Botanical Society, Mr. McNab read a notice of the plants which had flowered in the botanic garden there in the two first months of the present year. In this notice, the dates on which the same plants (with a few exceptions) flowered in 1850 are also given; and as the plants named were all grown out of doors, they indicate a remarkable difference in the temperature of the two seasons. Last year we find Geum pyrenaicum only flowered on the 22nd of March, and this year it was in flower by the 20th of January, being more than two months earlier than it was in 1850. The following table will show the extent of the difference:—

	Date of flowering. 1851.	Date of flowering. 1850.
Alnus glutinosa	Jan. 13	
Eranthis hyemalis	„ 15	Feb. 14
Primula vulgaris	„ 16	„ 14
Corylus Avellana	„ 16	„ 16
Erica herbacea	„ 16	
Galanthus nivalis	„ 17	„ 11
Lamium album	„ 18	
Helleborus odorus	„ 20	„ 14
Geum pyrenaicum	„ 20	March 22
Leucojum vernum	„ 20	Feb. 18
Vinca minor	„ 23	„ 23
Symphytum caucasicum	„ 23	March 14
Doronicum caucasicum	„ 25	„ 2
Crocus Susianus	„ 26	Feb. 16
Potentilla Fragariastrum	„ 26	„ 25
Vinca major	„ 26	March 11
Tussilago alba	„ 26	„ 12
Lamium maculatum	„ 26	„ 19
Galanthus plicatus	„ 28	Feb. 14
Daphne Mezereon	„ 28	„ 22
Tussilago nivea	„ 28	March 2
Knappia agrostidea	„ 28	Feb. 22
Cerastium Biebersteinii	Feb. 1	
Arabis procurrens	„ 1	
Rhododendron Nobleanum	„ 2	
Arabis ibericum	„ 3	
Crocus vernus, and varieties	„ 3	Feb. 26
Mahonia aquifolium	„ 3	
Kalmia glauca	„ 3	
Cerasus Lauro-Cerasus	„ 3	
Symplocarpus fœtidus	„ 4	„ 18
Symphytum tauricum	„ 6	
Pulmonaria mollis	„ 7	March 11
Asarum Europæum	„ 10	„ 7
Iberis sempervirens	„ 10	„ 9
Helleborus lividus	„ 11	
Aponogeton distachyon (in open-air pond)	„ 12	„ 14

Sisyrinchium grandiflorum (Warriston Lodge)	Jan. 27	„ 12
Tussilago hybrida (Canonmills Cottage)	„ 25	
Orobus cyaneus (Canonmills Cottage)	Feb. 5	

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEATH.
Day.	8 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8-9a.m	2 p.m.	10 p.m	
	in. cts.	in. cts									
Feb. 20	29.81	29.76	45	51½	43	S. West	lively	cloudy	cloudy	cloudy	rain
21	29.80	29.95	39	47	37	N. Easterly	calm	cloudy	fine	fine	dry
22	29.95	29.96	30½	48	40	S. East	lively	fog	sun	cloudy	dry
23	29.94	29.84	31	47	40	S. East	lively	fine	sun	fine	dry
24	29.81	29.78	39	47	44	S. by East	gentle	fine	sun	fine	rain
25	29.79	29.98	36	47	43	East by North	brisk	fog	sun	cloudy	dry
26	30.18	30.32	35	43	32	North by East	brisk	fine	sun	fine	dry
27	30.38	30.22	28	42	35	Northerly	lively	cloudy	cloudy	fine	rain
28	30.33	30.00	30½	41	35	North	gentle	cloudy	fine	fine	snow
Mar. 1	30.23	30.14	29	41	36	N. Westerly	lively	fine	cloudy	fine	dry
2	30.30	30.36	31	41	34	North by East	gentle	cloudy	cloudy	cloudy	snow
3	30.27	30.11	32	41	38	Westerly	gentle	fine	hazy	fine	dry
4	30.11	29.99	34	48	42	S. West	gentle	cloudy	fine	cloudy	dry
5	29.78	29.64	40	47	47	S. W., W.byN.	gentle	cloudy	cloudy	cloudy	rain
6	29.65	29.86	32	48	39	N. N. West	fresh	fine	cloudy	cloudy	dry
7	29.89	29.93	35	44	36	W. by South	gentle	cloudy	fine	cloudy	dry
8	29.95	30.03	35	47	38	East	gentle	cloudy	cloudy	cloudy	dry
9	29.98	29.70	31½	46	41	S. S. West	lively	cloudy	cloudy	cloudy	rain
10	29.52	29.80	37	41	37	N. N. West	lively	cloudy	cloudy	cloudy	rain
11	29.90	29.97	32½	47	32	N. N. West	lively	fine	sun	fine	dry
12	29.72	29.60	32	40	39	S. West, S. E.	gentle	cloudy	cloudy	cloudy	rain
13	29.60	29.78	34	49	39	W. by South	gentle	fine	sun	fine	dry
14	29.80	29.80	34	54	41	W. by South	gentle	fine	sun	fine	dry
15	29.72	29.74	36	42	38	Every way	gentle	cloudy	cloudy	fine	wet
16	29.76	29.75	34	52	40	N. Westerly	gentle	fine	sun	fine	dry
17	29.78	29.60	35	43	42	E. S. E.	lively	cloudy	cloudy	cloudy	wet
18	29.33	29.68	37	52	43	S. West	strong	cloudy	cloudy	fine	wet
19	29.68	29.40	40	51	51	S. West	strong	fine	cloudy	cloudy	wet
20	29.39	29.39	45	55	44	S. West, South	fresh	fine	sun	fine	dry
21	29.36	29.27	45	55	42	South Wstly.	lively	cloudy	sun	fine	dry

ESTIMATED AVERAGES OF MARCH.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.77	28.87	66	24	48.9

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
46.56	35.16	40.86

WEATHER AND PHENOMENA.

February 20—Overcast; 21—Frosty air, gleams of sun; 22—Hoar frost; 23—Fine fresh breeze, lull at night; 24—Some small showers; 25—Cold haze, sunny afternoon; 26—Lively cool day; 27—Small showers; 28—Generally fine, a mere hint of snow; Numerous solar spots on the 22nd day.

LUNATION.—Last quarter, 22nd day, 9h. 38 min. evening.

March 1—Keen frost early, fine; 2—Overcast, a little snow early; 3—Chilly air, with haze; 4—Finely tinted clouds, some sun; 5—Gloomy, small showers before noon; 6—Superb sunrise; 7—Fine and bracing; 8—Cold, overcast; 9—Fine forenoon, rainy night; 10—Some sleet, cold biting air and rain; 11—Cheerful though cloudy, clear night, just at frost; 12—Overcast, fickle wind, a wet day; 13—Lively fine day; 14—A little rime, then fine and warm; 15—Profuse rain early, and most of the day temporary floods; 16—Fine; 17—Cold rain for hours; 18—Very rainy till 3 or 4; 19—Red sunrise, windy, wet day; 20-21—Fresh air, both fine, with the mere hint of a slight shower on each. The Equinox took place at 4h. 56 min. on the morning of 21st.

LUNATIONS.—New moon, 3rd day, 1h. 15m. morning. First quarter, 10th day, 9h. 45m. afternoon Full moon 17th, day, 1h. 19m., afternoon.

PROSPECTIVE REMARKS.—Nearly thirty years have elapsed since I was induced, by the evidence of attested facts, to pay great attention to the two equinoxes, and their influences upon the intervening seasons. The table will point out the date and hour of the one just past. The previous weather, and that now existing, place its meteorological character beyond question or doubt. South and southerly brisk currents, profuse and recurring rains, a barometer falling from a previously low position, attest the prospect of a *dripping summer* and *critical harvest*. May an equitable adjustment between landlords and tenants—that only safe measure which will equally benefit every class of society—be speedily adopted. May the Almighty deign to confer that "wisdom profitable to direct" which will effectually secure abundance for the people, and avert the inevitable curse that must fall upon those parties who would selfishly withhold the corn. J. TOWERS.

Croydon.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MARCH.

The unusually large quantities of rain which have fallen in most parts of England almost daily during the past month have had the effect of materially checking the progress of out-door farm labours. The consequence is, that both ploughing and sowing are very backward, especially in the lowland districts; and some time must, we fear, elapse ere they will be re-commenced under what may be termed favourable auspices. The saturated condition of the soil operates, we need scarcely say, prejudicially to the interests of the agricultural body; yet it must be evident to all parties that the rapid extension and development of scientific principles of drainage—by which much surface water is more readily carried off—cannot fail to be highly advantageous to the farmer at this particular period. The dampness of the weather having materially affected the condition of the wheats, in stack as well as in granary, the supplies of really fine qualities exhibited in our various markets have been unusually small. This circumstance, aided by a statement which has gained general currency to the effect that the French government is about to make large purchases of grain to place in store to meet future contingencies, has induced greater firmness on the part of home-growers as well as importers, and prices have advanced about 1s. per qr. Notwithstanding that we shall shortly have the Baltic ports open, the impression is that the above improvement is likely to be well maintained during the coming month, as nearly or quite the whole of the supplies have now arrived from the westward. Our opinion is that, until the shipments of flour from France show a considerable falling off, it will be in vain that we look for any what may be termed activity in the demand, for the all-important reason that, whilst the imports of that article continue on the present extensive scale, both millers and bakers will refuse to add materially to their stocks. Foreign competition in its present form leaves no room for speculation; and, until it is removed, a revival in the home-trade, notwithstanding that consumption is unusually large, appears to be wholly out of the question.

For the time of year, most of our markets, particularly those in the metropolis, have been very extensively supplied with potatoes, in excellent condition; indeed, it is a general observation that the supplies brought forward during the past four months have never been equalled. When we consider the small arrivals from abroad, and, consequently, that consumption has been almost wholly met by the home-growers, the natural inference is that the produce of last year's crop was unusually large. This point we urged upon the attention of all parties shortly after the result of the growth became known, and we may now state that the quantities of potatoes still on hand are sufficiently large to have their usual effect upon the value of breadstuffs. Although prices have ruled low for some time past, it is admitted that those of potatoes have paid better than wheat; hence, we find that in many counties the farmers have determined to increase the breadth of land under that esculent. Whether this will prove a judicious change time alone must determine, yet that great comparative losses have been sustained by the growers of wheat is evident to all acquainted with agricultural affairs.

The lambing season has gone on most favourably. The "falls" have been above the usual number. An extraordinary instance may be here noticed. A grazier, residing at Edmonton, purchased, in October last, 200 Shropshire ewes, the produce of which has turned out as follows:—

	Lambs.
90 produced	270
100 produced	200
10 produced	10
Total	480

Out of the above extraordinary number only 9 have been lost; 200 are being brought up by the ewes, the remainder by hand.

The transactions in linseed cake have been extremely small, not only in London, but likewise at the outports. Prices rule very low in comparison with those of many former seasons, and large quantities of foreign cakes imported some months since still remain on hand. Linseed has, however, improved in value, but the demand has been far from active.

We have still to report large arrivals of stock from the continent, particularly from Holland; but their condition has been miserably deficient, notwithstanding that the sheep—which are now coming mostly out of the wool—have slightly improved. The wool trade has greatly disappointed the hopes of the home-growers as well as the importers. Fine English qualities, fit for mixing with colonial, have changed hands to some extent, at full prices; but low and ordinary kinds have tended downward. The imports of the new clip from Australia have been small; but large supplies are close at hand, and which will be brought to public competition in May. The quantity of wool at this time in the manufacturing districts being small, it is by no means improbable that prices will go higher.

Both in Ireland and Scotland the corn-trade has exhibited signs of improvement, but the advance in prices has been unimportant. Most of the granaries at the outports are full of foreign grain. There has been a slight improvement in the hay and straw markets in London. Meadow hay has sold at from £2 10s. to £4; clover, £3 to £4 4s.; and straw, £1 1s. to £1 9s. per load.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

As is almost invariably the case at this period of the year, the supplies of fat stock on sale in the principal markets have exhibited a falling off, both in number and quality; hence, the general demand has somewhat improved; and both beasts and sheep have sold on rather higher terms. The immense amount of speculation in tallow has advanced the price of rough fat to 2s. 2½d.; but we doubt much whether the improvement will be supported for any lengthened period. The butchers almost generally agree in stating that the stock, both English and foreign, has continued to carry a large quantity of internal fat; and we may safely assume, looking to current prices, and those charged to consumers, that their profits are far in advance of those realized by the graziers. From abroad, the imports have been on a very liberal scale, and greatly in excess of those at some corresponding periods. We have been told that the speculation is a losing one; but the anxiety of foreigners to supply our markets renders the truth of the observation very problematical.

The foreign imports into London during the month have been as under:—

	Head.
Beasts	1,750
Sheep	5,799
Calves	752
Pigs	80
Total	8,381
Corresponding month in 1850	6,004
Same month in 1849	8,034
Ditto ditto 1848	4,421

About 1,500 head have been landed at the outports, mostly from Holland, with a few from France. No supplies have come in from Spain for several months; neither are any expected, owing to the high freights, and the low value of the stock here.

The total supplies exhibited in Smithfield have been:—

	Head.
Beasts	16,040
Cows	314
Sheep and lambs	85,920
Calves	1,236
Pigs	2,184

During the same month last year, there were shown 16,715 beasts, 506 cows, 95,480 sheep and lambs, 1,321 calves, and 1,881 pigs. From Norfolk, Suffolk, Essex, and Cambridgeshire, 8,600 beasts have come to hand, and formed a portion of the above supplies. The receipts from other parts of England have amounted to 2,500; and from Scotland 1,060 beasts. About 20 beasts and 200 pigs have arrived direct by sea from Ireland.

COMPARISON OF PRICES.

(Per 8lbs., to sink the offal.)

	March, 1850.				March, 1851.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef, from	2	4 to	3	8	2	4 to	3	10
Mutton	2	8 to	4	4	2	10 to	4	8
Lamb	5	0 to	6	0	5	0 to	6	0
Veal	3	0 to	3	10	3	0 to	4	0
Pork	3	0 to	4	0	3	0 to	4	0

In the early part of the month, very large quantities of meat were received up to Newgate and Leadenhall from Scotland and different parts of England. Since about the 15th they fell off materially, in consequence of the dampness of the weather. Prime beef and mutton have sold steadily, at full prices. In other kinds of meat very little business has been transacted. Beef, from 2s. 2d. to 3s. 4d.; mutton, 2s. 6d. to 4s.; lamb, 4s. 8d. to 5s. 10d.; veal, 3s. to 4s.; and pork 2s. 6d. to 4s. per 8lbs. by the carcase.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF MARCH.

The position of the Russell cabinet is so precarious as to render it certain that matters cannot long continue as they are. We have for the last month had a government permitted on sufferance, and, notwithstanding the evident disposition on the part of the opposition to bide their time, the Ministry is evidently doomed; and if not defeated before the end of the sessions, a dissolution must then inevitably take place. A general election will afford the country an opportunity of expressing its opinion in respect to the experiment of free trade, and show whether its practical working has strengthened or weakened its advocates. That the Manchester school will use its utmost endeavours to support its favourite theory cannot be doubted; and that the parties interested on that side will go to work in a systematic and energetic manner is equally certain. The time for a trial of strength is in all probability not far distant, and we would have our agricultural friends be prepared for the struggle. The next election must decide whether the principles of free trade are in accordance with the wishes of the majority, or whether we are to retrace our steps. The question is of vital importance, and calls for a clear and decided answer. Let those who are satisfied of the mischievous tendency of our recent legislation be prepared to express their objection, by returning such members as will boldly and firmly carry out the principles they believe right, and advantageous for the country. The open and straightforward course pursued by Lord Stanley entitles him to the confidence of the country party; it rests with the electors to give him a majority in the House of Commons, and the impending ruin of the agricultural interest may yet be averted.

Our only object in referring to the political position of affairs is to urge farmers to make use of the time which may intervene before a dissolution takes place. Their opponents will not be idle; the clap-trap cry of the cheap loaf will again be raised. They will be prepared with candidates and paid lecturers to overrun the country. Let farmers then be equally active to prove the fallacy of the promised blessings of free trade—to show that cheap bread is of little avail without employment, and that an increase of foreign trade is dearly bought by the sacrifice of the most important interest in the country. Here we shall leave this matter, with a hope that better times may be in store for our agricultural friends.

In our remarks of the course of the grain trade during the month, the weather demands our first notice, as we have now approached a period of the year when atmospherical changes have a direct influence on prices.

March commenced with tolerably fine weather; indeed, we may say that the first fortnight was favourable for all kinds of outdoor labours. This was taken advantage of by the husbandmen, and large breadths of land were prepared for the reception of the spring crops. Ploughing, sowing, &c., went on very auspiciously until the 15th inst., but since then we have had frequent and heavy rains, which have put a stop to field work; and the land is still too wet to allow of an immediate resumption of the labours so necessary to be completed. The absence of frost during the greater part of the winter, and the favourable intervals which this afforded for preparing the land, enabled farmers to accomplish a considerable extent of work during a time of year when, in the ordinary course of things, little can be done; and, notwithstanding the present interruption, spring tillage is, we are inclined to think, quite as forward as is usually the case at the corresponding season of the year. There is, consequently, no cause for uneasiness on this head; and there can be no doubt that the seed already committed to the soil will vegetate all the sooner, owing to the plentiful supply of moisture it has received.

The reports respecting the appearance of the autumn-sown wheat are, as yet, of a satisfactory character—we hear of few cases of premature luxuriance, the accounts generally describing the plant as healthy, without being too forward; the cold dry winds towards the close of February and during the past fortnight in March having checked its growth. Appearances can, however, be little depended on at this early period; and we are now approaching a time of year when the course of events must always be in so great a measure regulated by the weather, that it would be unsafe to predict the probable range of prices, even for a month in advance.

The fluctuations in the value of wheat have not been important since our last. The tendency of prices has, on the whole, been rather upwards, particularly in the agricultural districts furthest removed from the coast, and where the extent of the continued arrivals from abroad have not been so directly felt. That a more decided rise would have taken place if the foreign supplies had been less abundant cannot be questioned, but the appearance of a large fleet of vessels off the coast laden with wheat and Indian corn from Black Sea and Mediterranean ports in the early part of the month, and the subsequent distribution of the supply to the different markets in England, Scotland, and Ireland, has, to a certain extent, counteracted the effect which the smallness of the home-deliveries, and the improvement wrought in the condition of the English wheat by the dry weather experienced in the beginning of the month, were calculated to have produced.

That prices of agricultural produce would be beaten down in this country to a ruinously low point by undue foreign competition, we were prepared to expect before the experiment of free-trade was tried; but we were scarcely prepared for such enormous supplies as we have since received, nor did we calculate on seeing the price of wheat, after so decidedly short a crop as that of last year, so low as it now is. A useful lesson may, however, be learned from the past. In the first place, it has been proved beyond doubt, that the whole of the statistics collected by the free-traders, and upon the strength of which the advocates of the repeal of the corn laws based all their arguments, were wholly fallacious.

The average price of wheat is now only 37s. per qr., and still supplies continue to pour into the country. This is a sufficient answer to the oft-repeated assertions, that the article could not be grown abroad at such rates as to allow of large importations when prices fell in this country to a point likely to injure the British producer. The fact is, that with a progressive decline in prices in our markets, we have had a materially increased importation from abroad, and there can be no doubt that so long as England shall offer a ready market for the surplus growth of the world, by allowing her ports to remain open, the cultivation of corn will be extended in Russia, America, France, &c. The imports of grain, pulse, and flour, into the United Kingdom have been as follow:—

	Month ending March 5, 1851.	Month ending March 5, 1850.	Increase.	Decrease.
Wheat	283,416 qrs.	133,386 qrs	150,030 qrs.	—
Barley ..	65,907	7,275	58,732	—
Oats......	56,829	3,207	53,622	—
Rye......	2,866	1,201	1,655	—
Beans.. .	17,759	39,145	—	21,386 qrs.
Peas	3,737	3,181	556	—
Maize....	82,614	101,549	—	18,905
Flour	446,803 cwts.	205,894 cwts.	240,909 cwts	—

This little table affords a fair proof of the steady increase of the supplies of the principal articles, more especially as regards wheat and flour.

At Mark Lane business has not been particularly active, but a slight improvement has taken place in the value of most kinds of grain. The arrivals of wheat coastwise into the port of London have been very small, the average weekly receipts having but slightly exceeded 2,500 qrs. The quantity brought forward by land carriage samples from the neighbouring counties, has been equally unimportant; but the principal millers have conducted their operations with so much caution, as to render it a matter of no slight difficulty to obtain even a trifling advance on previous prices; indeed, if we allow for the improved condition in which the samples have come to hand, scarcely any actual rise can be said to have taken place. The general tone of the trade was precisely the same the three first Mondays in the month, a clearance was on each occasion made, at rates slightly in advance of those previously current; but the improvement was at no time deemed sufficient by factors to warrant a general rise in quotations of 1s. per qr. Matters remained in this state until the 24th, when a somewhat improved demand enabled factors to establish a rise to the extent above named on all good-conditioned qualities, and we consider prices 1s. to 2s. per qr. higher than they were at the close of February. The averages have not fluctuated materially; the lowest weekly return was that published on the 17th March, viz., 36s. 9d. per qr.; and looking back to the past, we find that no instance of an equally low average for the kingdom has occurred since 1836; but then the lowness of prices was caused by internal plenty, having had a succession of abundant harvests in 1834, 1835, and 1836.

The arrivals of foreign wheat into the port of London have been liberal for the period of the year, having fallen little short of 100,000 qrs. The major part of the supply has been from ports east of Gibraltar, some of very low quality, but a fair proportion consisting of good useful wheat. Notwithstanding the extent of the supply, importers have displayed considerable firmness, and as they could not succeed in placing so large a quantity, except at very low prices, many have determined to land; stocks in granary have consequently accumulated, and admitting that the receipts from the Black Sea and Mediterranean may be comparatively small for some months to come, there does not seem much prospect of what we have on hand being consumed previous to the time when the spring shipments from the north of Europe are generally looked for. We can therefore see no reason to calculate on any rise of importance in the commoner descriptions of foreign wheat, and this appears also to be the opinion of the holders, they having in general shown a disposition to facilitate business. The transactions have, nevertheless, been on a somewhat retail scale, which may be accounted for by the fact that the country millers have had depôts of foreign wheat at different points on the coast, from which they have been enabled to draw supplies at a less cost than from London. The sorts in which most business has has been done have been Polish Odessa, Barletta, Marianopli, and Egyptian; the former has sold at from 33s. to 35s., Barletta (red) at from 38s. up to 40s., fine Marianopli at 36s. to 37s., and Egyptian at from 22s. to 24s. per qr., according to quality and condition. Baltic wheat having been held relatively higher, has met with very little attention; the commoner descriptions of red may be quoted 38s. to 40s., fine Rostock 44s. to 46s., and Danzig from 42s. to 50s. These rates show very little change, when compared with those current at the end of February. The sales of floating cargoes through London houses have been rather extensive during the month. Polish Odessa wheat off the coast—which was in the early part of the month obtainable at 33s. per qr., cost, freight, and insurance—subsequently rose to 34s.; and there are now so few parcels remaining undisposed of, that 35s. per qr. is the price which has been asked during the last week. Other sorts have brought corresponding rates. Several cargoes from Egypt were sold as low as 21s., whilst the latest sales of that sort have been at 23s., and even 24s. per qr., cost, freight, and insurance.

The top price of town-manufactured flour has not varied. The large millers complain bitterly of the injury they are suffering from the competition with France, and many are working short time, as they can purchase the manufactured article cheaper than it can be made for in this country. The provincial millers are in the same predicament, and the complaints from Ireland are daily increasing. Very capital French flour has been freely offered at 30s., and the commoner sorts at proportionate rates, whilst really choice may be had at 32s. to 33s. per sack. The dressing of this flour is superior to that of English, and many of the samples, besides being of fine colour, possess great strength. The arrivals into the port of London from France have averaged over 5,000 sacks per week. The supplies from the United States have been comparatively small, and prices of the latter have undergone scarcely any change. The duty on flour at the present prices is only about 3 per cent. on the value, all other manufactured goods are, we believe, protected by an import duty of 10 per cent. So much for the consistency of free trade.

The receipts of home-grown barley have at no period of the month been large, and the general impression is that stocks of this grain have been reduced into a narrow compass in most parts of the kingdom. In London the quantity held is certainly small. In the early part of the month there was, in addition to the usual demand, a good deal of inquiry for seed, and very full terms were paid. During the last week or two the demand has rather slackened, but sellers have not made any concession, and fine malting samples are still worth 30s.; indeed, superior quality could scarcely be secured at that price. The commoner kinds have sold relatively cheaper, say distilling 23s. to 24s., and ordinary malting parcels 25s. to 26s. per qr. The arrivals of this grain from abroad have been moderate, but as there has been no disposition to speculate, the supplies have proved amply sufficient to provide for the consumptive demand. Good fresh Baltic grinding qualities have brought from 19s. up to 22s. per qr., according to weight and condition. Several cargoes of Egyptian have come forward, for which 16s. to 17s. per qr. has been realized.

In malt a steady business has been done at about previous prices. The brewers generally anticipate a greatly increased sale for beer, in consequence of the expected influx of visitors to the Exhibition, and have gradually added to their stock, to be in a position to meet any extra demand.

The arrivals of oats, including foreign, have been considerably below the quantity required for the consumption of the metropolis and its environs, and the probability is that this will continue to be the case for some time to come. The deliveries from the English farmers have nearly ceased, and a considerable falling off has taken place in the arrivals from Scotland; it is therefore tolerably plain that we shall during the spring and summer have to depend on Ireland and foreign countries for our supplies. The advices from the sister isle would lead to the belief that she will not be in a position to afford us much assistance; and though we may calculate on good arrivals from the continent later in the year, as yet very few shipments have been made for this country. Under these circumstances a moderate rise in prices of oats does not appear unlikely; and the tendency of prices has since our last been decidedly upwards. Light English feed, weighing only 33 to 34 lbs. per bushel, have lately sold at 17s.; good foreign of 38 to 40 lbs., at 18s. to 19s.; Irish, 18s. to 20s.; and Scotch, 19s. to 21s. per qr. Potato and brew oats have brought proportionate rates; and altogether the trade has a firm and improving appearance.

English beans have come rather sparingly to hand. During the dry weather in the early part of the month there was rather an active inquiry for the finer sorts for seed, and very full terms were paid for handsome samples. Within the last week or two the seed demand has fallen off, but prices have not given way; and quotations are quite as high as they were when we last addressed our readers. The arrivals of beans from abroad have not been large, but the quantity received has proved sufficient for the demand; and sales have proceeded somewhat slowly, at about previous terms.

Peas of home growth have been taken in small quantities; and their value has undergone very little change, prices being about the same as they were at the end of February. Foreign peas have been difficult to quit throughout the month, and the granaried stocks have been but very little diminished. During the summer months peas are little used, either for human food or for cattle; and there is consequently not much chance of prices improving.

In Indian Corn on the spot next to nothing has been done; but a good many floating cargoes have changed hands during the month at full prices. The demand has been almost entirely on Irish account; and nearly the whole of the recent arrivals off Falmouth have been ordered to proceed to different ports in Ireland.

With the approach of spring renewed activity may be expected in the corn trade abroad; but up to the date of the latest advices business had remained very quiet at the principal continental markets. The very discouraging accounts from hence in February had not been wholly without influence on the minds of holders; they had, however, manifested great unwillingness to accommodate themselves to the turn affairs had taken here. The fact is that many of the principal Baltic merchants have all along cherished the idea that English buyers would sooner or later appear; and under this belief they commenced purchasing early in the autumn, and continued their operations (though on a less extensive scale) through the winter. Prices were then considerably higher than they are now, hence the stocks they hold cannot be sold without loss, and this they are exceedingly unwilling to submit to. Meanwhile, the farmers bring forward supplies from week to week; and as there are no speculators to buy up what comes to market, the parties holding granaried stocks cannot expect to be long able to keep up prices, if an increased British demand does not arise to assist them. The Danzig merchants have hitherto manifested a determination to trust to the chapter of accidents for better prices later in the year, and have not offered their best high-mixed old wheat below 42s. to 44s. per qr.—rates wholly out of proportion to those current in our markets. In this position of affairs scarcely any business has been done.

To show how sensitively alive the foreign merchants are to the sligbest indication of an improvement in the trade here, we need only say, that on the strength of the somewhat firmer tone of our advices of the last few weeks, prices have advanced at all the near continental markets, including the Lower Baltic ports.

The weather appears to have been cold during the first fortnight in March, and uneasiness is expressed by some of our correspondents as to the effect which may have been produced on the crops in the ground by the somewhat trying changes which had taken place in the temperature; powerful sunshine having frequently succeeded severe night frosts.

The growers do not seem to have brought wheat forward very freely; and though there had been very little export demand, most of what had come to hand at the principal Pomeranian and Mecklenburg ports had found buyers, and prices were 1s. per qr. higher at the date of our latest advices than they had been earlier in the month. The latest quotation from Rostock for 61 to 62 lbs. wheat is 40s. per qr., and 20s. per qr. for 52 lbs. barley, freight and insurance being included in the price.

Letters from Stettin of the 21st. inst. inform us that the navigation was open, but that few shipments of grain were in progress. Wheat had, within the week, risen 6d. to 1s. per qr., and all spring corn had been held with great firmness. The best heavy qualities of wheat might have been bought at 34s. 6d. to 35s., and red Stettin, weighing 60 to 61 lbs., at 33s. to 34s. per qr., free on board, with 2s. 6d. per qr. freight to the east coast of Great Britain.

From Hamburg we learn that prices had gradually crept up for two or three succeeding market-days under the influence of what were deemed more encouraging accounts from hence. Upland wheat, on the spot, of 61½ lbs. weight had been held very firmly at 37s. per qr., free on board; but it had been impossible to make much progress in sales at that price. A few parcels from outports had been placed, for Pomerania wheat weighing 61½ lbs. per bush. 35s., for Holstein of 62 lbs. weight 35s. 3d., and for a lot of 60 lbs. kiln-dried wheat, to be shipped from Denmark, equal to 33s. 3d. per qr., all free on board, had been paid. Prices of barley and oats are relatively higher than those of wheat on the continent; and, unless quotations for these articles advance here, we can scarcely expect consignments of any importance.

Early in March the principal French markets were very depressed for both wheat and flour, but within the last week or two a decided improvement has taken place in the tone of business in that country, under the impression that the English prices had touched the lowest point.

Shipments on rather a liberal scale were still being made for Great Britain, and though we do not expect quite such large supples from thence as we have hitherto been receiving, still we may safely calculate on fair arrivals, so long as the slightest margin for profit remains.

In the Mediterranean prices were by the latest accounts relatively higher than in this country, still shipments were being made at several of the Italian ports for the English markets.

By the most recent advices from the Black Sea we learn that the navigation was still closed, and that business was consequently quiet.

The tone of the American letters is of much the same character as before. With comparatively little export demand, prices of breadstuffs had been well supported; and at New York, Baltimore, and Philadelphia, flour was, according to the latest accounts, too dear as compared with its value at London, Liverpool, &c., to offer much encouragement to consign.

CURRENCY PER IMPERIAL MEASURE.

Shillings per Quarter

WHEAT, Essex and Kent, white, new..	38	to 43	fine up to	49
Ditto ditto old ..	41	45	„	49
Ditto ditto red, new....	36	41	„	43
Ditto ditto old	39	41	„	44
Norfolk, Lincoln, & Yorksh., red, n.	33	38	„	41
Ditto ditto old..	39	41	„	43
Ditto ditto white, new	39	41	„	45
Ditto ditto old..	41	43	„	45
BARLEY, malting, new........................			23	25
Chevalier, new			30	31
Distilling, new			22	24
Grinding, old..........................		18	21	22
MALT, Essex, Norfolk, and Suffolk, new	43	45	extra	47
Ditto ditto old	44	47	„	49
Kingston, Ware, and town made, new	50	53	„	55
Ditto ditto old	48	54	„	56
OATS, English feed, new............	15	17	fine	19
Potato, old	17	21	extra	22
Scotch feed, new	17	20	fine	21
Ditto, old.....................	18	21	extra	22
Irish feed, white, new	16	17	fine	19
RYE	24	26	old 23	25
BEANS, Mazagan	24	25	„ 25	27
Ticks...........................	25	26	„ 27	29
Harrow.........................	25	27	„ 28	31
Pigeon	27	29	„ 29	32
PEAS, white boilers...............	26	28	„ 26	28
Maple	26	28	„ 27	29
Grey............................	25	27	„ 27	28
FLOUR, town made, per sack of 280 lbs.	—	—	„ 35	40
Country marks..................	—	—	„ 28	32

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

	Wheat.		Barley.		Oats.		Rye.		Beans		Peas.	
WEEK ENDING:	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Feb. 15, 1851..	37	8	22	11	16	2	23	10	25	5	26	10
Feb. 22, 1851..	37	2	22	10	15	11	23	8	25	4	27	1
March 1, 1851..	36	11	22	7	16	0	24	4	25	3	25	8
March 8, 1851..	36	9	22	7	16	2	24	4	25	7	26	7
Mar. 15, 1851..	37	2	23	1	16	6	23	3	25	6	25	8
Mar. 22, 1851..	37	5	23	3	16	9	22	8	25	8	25	9
Aggregate average of last six weeks	37	2	22	11	16	3	23	8	25	6	26	3
Comparative avge. same time last year	38	1	23	8	15	3	22	1	24	5	25	9
DUTIES........	1	0	1	0	1	0	1	0	1	0	1	0

SEED MARKET.

FRIDAY, March 28.

The continuous arrival of foreign Clover-seed has somewhat checked the demand for that article. In prices, however, we have no decline to notice. Canary steady, and quite as dear. Linseed is held for more money.

Duty was paid on the following quantities of foreign Cloverseed up to the 22nd inst.:—

	1851.	1850.
London	48,271	46,732
Liverpool	4,076	3,928
Hull....	14,624	11,131

BOROUGH HOP MARKET.

FRIDAY, MARCH 28.

There is a slight falling off in the demand for nearly all kinds of hops—the show of which has somewhat increased, and last week's are with difficulty supported. So little is doing in bags that the quotations are almost nominal. The following are factors' prices:—

Mid and East Kent pockets, per cwt.	80s. to 130s.
Weald of Kent do.	75s. to 84s.
Sussex do.	64s. to 80s.

POTATOES.

BOROUGH AND SPITALFIELDS, FRIDAY, March 28.

No arrivals of Potatoes have taken place from the continent this week, but the supplies coastwise and by land carriage continue large for the time of year, and in most excellent condition. The demand is very inactive, at barely stationary prices.

Yorkshire Regents, per ton	70s.	to	90s.
Scotch	60s.	to	70s.
Scotch Cups............	60s.	to	70s.
Cambridge and Lincoln Regents	50s.	to	75s.
French Whites...............	50s.	to	60s.

HAY MARKETS.

THURSDAY, March 27.

The best Meadow Hay still continues in steady request, at full prices. In Clover Hay and Straw, the supplies of which are seasonably good, very little is doing.

At per load of 36 trusses.

	Smithfield.		Cumberland.		Whitechapel.	
Meadow Hay......	55s. to	82s.	50s. to	82s.	50s. to	81s.
Clover, do.	70s.	82s.	60s.	80s.	70s.	84s.
Straw............	22s.	28s.	23s.	30s.	21s.	28s.

TALLOW MARKET.

FRIDAY, March 28.

The speculative demand having fallen off, our market is less active, and prices are somewhat easier than at the commencement of the week. To-day sales of P.Y.C. on the spot have taken place at 40s. to 40s. 6d., and for delivery during the last three months 40s. is demanded. Town Tallow 38s. per cwt. net cash for fine; rough fat, 2s. 2½d. per 8lbs. Our St. Petersburgh letter states that holders were firm at full quotations. The imports, since our last, have amounted to 310 casks from Havre, and 9 do. from Antwerp.

WOOL MARKET.

FRIDAY, March 28.

Notwithstanding that the supply of most kinds of Wool on offer in the private contract market is comparatively small, the demand is in a very inactive state at barely stationary prices. This week's imports have amounted to 1,094 bales from Hobart Town, 267 from Bombay, 8 from Antwerp, 659 from the Cape, 124 from Swan River, 589 from Algoa Bay, 4 from Leghorn, and 10 from Hambro'.

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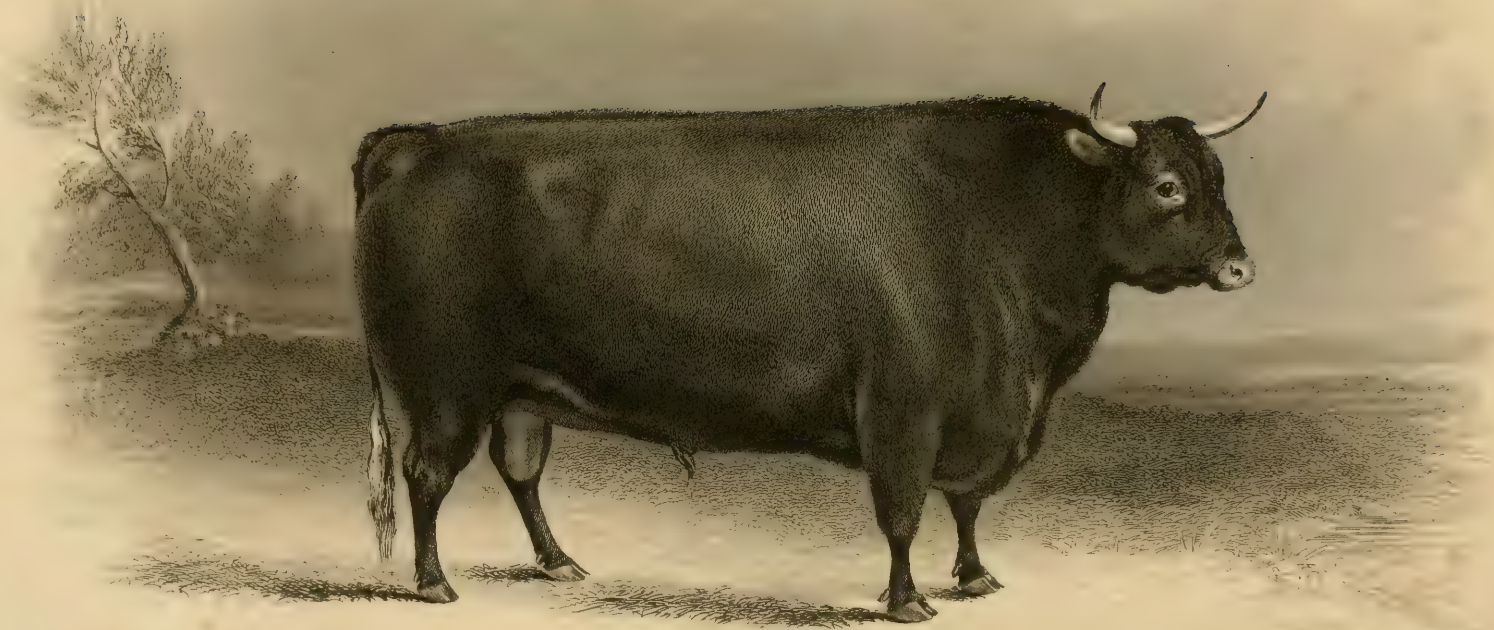

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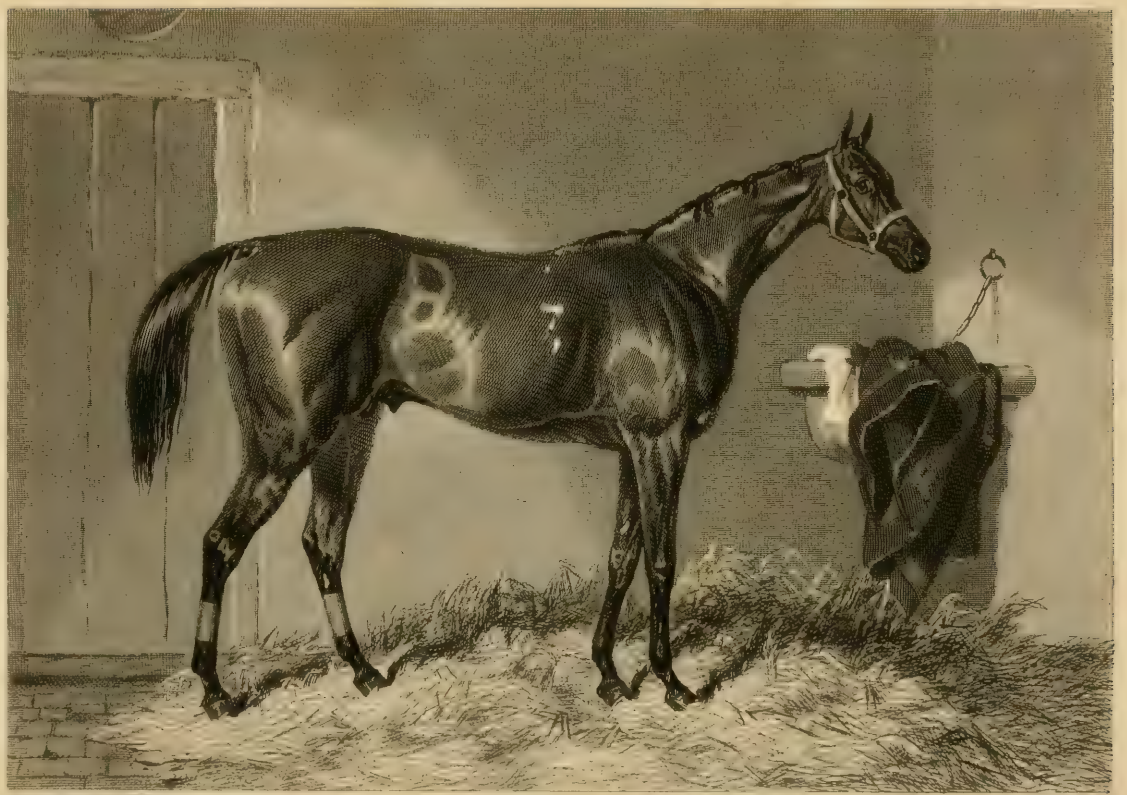

Collingwood.

Winner of the Royal Hunt Cup, [illegible]

[illegible]

THE FARMER'S MAGAZINE.

MAY, 1851.

No. 5.—Vol. XXIII.] [Second Series.

PLATE I.

A DEVON BULL,

The property of George Turner, Esq., of Barton, near Exeter, for which the first prize of Forty Sovereigns was awarded at the meeting of the Royal Agricultural Society of England, held at Exeter, July, 1850. Whether in his own county, or in other parts of the country where the Society's meetings have been held, Mr. Turner has highly distinguished himself as a successful winner of prizes for Devon cattle.

PLATE II.

COLLINGWOOD.

Winner of the Royal Hunt Cup, 1849.

(For description see page 443.)

DOMESTIC AND CULTURAL ECONOMY.—APPENDIX.

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON.

A few desultory observations suggest themselves as applicable in bringing this series to its close. In the foregoing articles, I hope that no point of moment has been overlooked; and, therefore, that the domestic cultivator, if he resolutely carry through the principles laid down, will be amply prepared to conduct his operations in garden and field to a satisfactory and profitable result. Long since the commencement of my series I met with an invaluable article in "Household Words," by Mr. Dickens, entitled "The Ace of Spades." Every cultural economist ought to study that truthful paper, which is to be found at p. 477 of vol. ii. Some persons in the agricultural districts have suggested doubts "on the *winnings* of the ace of spades." A second article, as rejoinder, was therefore published in the number (51) of March last, at page 505. (See "Chips.—The Spade"). Without borrowing one word from these papers, it is only necessary to state that, for an outlay of *fourpence*, the reader may obtain a fund of information, the validity of which can be ascertained by a strict application of the principles that it has been my object to establish.

Drainage has been urged as being the foundation of every attempt. On this subject I again refer to Mr. Cuthbert Johnson's article upon "Irrigation, &c.," December, 1850, No. 6, of this Magazine, pp. 467-9. If an owner or occupier of a small property have his dwelling so situated on rising ground as to command a fall sufficient to carry all the fluid matters towards field or garden, he can, at a trifling outlay, obtain all the advantages derivable from liquid manure to the extent described in that article: I say this advisably, from observation! He, moreover, will do the cause of science much service by solving the problem of the efficiency of sewerage manures. We hear and read a great deal on the subject; and every experiment prudently conducted must tend to the extention of trustworthy facts!

Wherever, and by whomsoever, land is cultivated effectually, so as to develop its utmost productive capabilities, crops *adapted to its peculiar constitution* will be borne in ample abundance; this fact is proved by the vast prolificity of the London market gardens! And here we may, in justice, offer our thanks to Mr. Cuthill, of Denmark Hill, for his instructive series of articles lately given in the columns of the *Gardeners' Chronicle.* Much information may also be culled from Mr. Middleton's "View of the Agriculture of Middlesex (1813"), which is referred to in the "Penny Cyclopædia," vol. xi., page 75; whence the following extract: The value of the produce of one year from *an acre* of garden ground is there given as received from a market-gardener. It is as follows:—"Radishes, £10; cauliflowers, £60; cabbage, £30; celery, first crop, £50; second crop, £40; endive, £30; making a total of £220 for the gross produce of an acre in twelve months." If a gardener *can* by diligence and assiduity constrain a piece of loamy ground to bear crops, year after year, improving all the while, what might not the agriculturists of England effect were every just appliance brought to bear upon the capabilities of our fine staple by the just and conjoint efforts of landlords and trustful tenants?

I have said that the crops of a garden should be adapted to the constitution of its land: thus, a sound, yet free-working loam, will produce everything that can be used upon a domestic homestead.

As to the *Cabbage-tribe,* the immense numbers of *Yorks* that can be raised by thousands upon a small extent of deeply-tilled and manured loam, is practically shown in the articles already mentioned; but none of this family would I recommend for dairy use, because they all impart a rank flavour to milk and butter. The *Turnip* varieties, including the otherwise estimable *Kohl-rabi,* though they produce much milk, are most objectionable on that account; and really *good milk* is very remunerative in the vicinity of great towns. *Carrots.*—The long orange and *White Belgian* are excellent, provided the *land be deep,* (manured at 16 or 18 inches below the surface), and of a sandy quality. Pure light loam, free from roots and stones, produces the straightest and cleanest spindles. In proof of the worth of white carrots, I extract a few lines from a paper by Sir Charles Burrell, in 1844, wherein he stated that he had only four acres, producing 1,200 bushels per acre, or in the whole 4,800 bushels; with these, twenty-four fatting beasts were fed, adding equal quantities of Swede turnips (both sliced by a machine) together with hay and oil-cake, up to the month of April, 1844. "For my cart-horses, twenty in number, about 10 lbs. of white carrots were used with a little corn and hay from November, 1843, to the following April; and the carrots were further applied in feeding twenty-four cows and two bulls to the same period, with *very great economy of hay.*"—"Jour. Roy. Ag. Soc., vol. v. p. 281." Twenty tons per acre merit attention, and the most judicious tillage!

But the root or tuber which appears to claim particular attention at the present time is the *Jerusalem Artichoke.* I grew it in Wilts and Berkshire with scarcely any trouble, between the years 1825 and 1846, for the table only, and therefore cannot speak experimentally upon its gross yield; however, so much has been lately written upon it as to induce great interest; and I therefore refer to the two valuable articles which are found in "The Farmer's Magazine" for January last, and at p. 271, of the number for March, by J. H. A yield of ten tons per acre surpasses that of the *potato,* which is generally obtained, and who ever observed disease in any part of the plant? The chemists have, at length, given us several analyses; and, by the one of M. Bracconot, we perceive that the tuber contains very nearly 15 per cent. of grape sugar, 3 of inuline, 1·22 of gum, 0·9 of albumen. The ashes of the whole plant exhibit, according to Professor Way, above 19 per cent. of phosphoric acid and 56 per cent. of potash; hence, they must prove a most valuable manure. The Jerusalem artichoke will grow and perpetuate its own extension on very poor land—the stems and leaves producing a sufficiency of manure; but, if bulk and weight for animal food be aimed at, generous tillage must be adopted, adding the ashes of the stems—and with corresponding advantage. *Sound guano* would, I doubt not, be very appropriate in consequence of the bulk of soluble saline phosphates, and the bone earth which it contains.

THE ADDITION OF SOLUBLE ORGANIC MATTERS TO IRRIGATION WATERS.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

To the advantages of irrigation the farmer's attention can hardly be too frequently drawn. There are, it is true, not always sufficient facilities for meadow watering attainable by every landholder, but the farms on which *something* very profitable in this way may not be accomplished, are much fewer in number than is commonly believed. Of those who possess springs or rivulets, it is quite unnecessary to speak: they possess a fountain of wealth, rarely employed to its fullest extent. In the very driest localities, capacious tanks for the storing of rain-water, and the interception of the farm-yard drainage, can be constructed. In very many places water may be raised by means of pumps worked by small windmills, or even steam engines; and these tanks or reservoirs may be generally so arranged, that the irrigation water when needed will flow on to the land by its own gravity. In any case, *when once collected* in reservoirs placed at a slight elevation above the land, the *application* of this weak liquid manure is accomplished at a cheaper rate for labour than any other fertilizer, since it spreads itself, as it were, over the land. The great object in these efforts is to collect as much liquid as possible. Generally speaking, it is the *water* which is deficient in quantity, and not the liquid manure. We may, in fact, regard it as an axiom, that the more the liquid manure is diluted with water for the irrigation of grass, the better. There have been several instructive reports on this subject, bearing upon the points to which I have alluded, published by the Board of Health, and one, as to the irrigation in Switzerland, by Mr. Henry Jenkinson (*Jour. R. A. S.*, vol. xi., p. 607). The irrigation on M. de Fellenberg's farm, at Hofwyl, is described by Mr. Jenkinson as being situated on a conical hill, the sides of which slope gradually away. When the late M. de Fellenberg first came there, this hill was little better than a swamp, while the low ground was frequently under water. Forty feet from the top of the hill, there exists a stratum of gravel, at which depth springs were discovered. M. de Fellenberg conceived the idea of draining the whole farm, and applying the water which existed on the gravel bed to the irrigation of the sides of the hill. (In a similar way, for the purposes of irrigation, Lord Hatherton has collected the land-waters of one of his Staffordshire estates.) He formed drains, mostly from 10 to 12 feet in depth, covering them above with flat stones, and filling them up with loose stones till within three feet of the surface, where he placed a layer of moss to prevent the soil from being carried away by the drains. A constant supply of water is derived by means of the drains constructed on the hill, and this water is collected in horizontal channels as it passes from the land, whence it is carried along the hill side to the different parts of the farm. The watercourse that conveys the water to the more distant localities is covered over, so that the water may not be affected by the temperature of the air; thus, when applied to the land, it is warm in winter and cool in summer. It is the intention of M. de Fellenberg to convert the whole hill-side into water meadows (part is now arable land). He thinks that he cannot irrigate too much. In the farm-yard are tanks in which every drop of liquid manure is collected. This is pumped up into a channel, and conveyed by it to the water courses; and thus, with the smallest amount of labour, some of the water meadows are irrigated with the water diluted with liquid manure. The grass from these parts is consequently richer and thicker; but the number of crops produced from land thus irrigated is the same as that which is produced from land irrigated with water alone. Many circumstances, however, indicate the great advantage of the mixture of the two. It is known that water once used in irrigation, loses its value for water meads; but it has been noticed in Switzerland (*Jour. R. A. S.*, vol. xi., p. 610), as well as in England, that such water which may have thus been rendered useless for irrigation, is generally again rendered available after passing through villages.

In a valuable report to the Board of Health, on the application of sewage water to irrigation and to agriculture, by Mr. W. Lee, several *facts* are contained, all illustrating the same truths. Thus, when speaking of Ashby de la Zouch, he observes—

"The Gilwiskaw brook drains from 1,500 to 2,000 acres of land, all cultivated, besides receiving several copious springs. In its passage through the town it takes the liquid refuse of several hundred houses, and there are also some open privies flowing into its course. Many years since some meadows, a short distance below the town, were brought under irrigation with this brook water, and the effect upon the value of the land has been most striking. The meadows contain about 40 acres, and John Mammatt, Esq., the Marquis of Hastings' agent, said that the Dowager Marchioness, to whom these 40 acres belonged, could not surrender the advantage of irrigation without compensation. He added, 'The land irrigated is worth £5 per acre rental; without irrigation it would not be worth more than £3 certainly. The irrigation of these 40 acres is worth £100 per annum. There is land in the parish which, within fifty years, let for 25s. per acre, but now lets for £5 an acre irrigated.'

"I examined these meadows, and found the arrangements of the most simple kind. The brook water is conducted along a slope by an open feeder, and then distributed over the meadows by open gutters. The expense incurred has been very trifling. There is only one sluice, and no mechanical power used.

"The grass is heavy, and appears quite free from that coarseness which I have heard attributed by some farmers to the use of liquid manure, but which I am satisfied arises from their using it in too concentrated a condition. As nearly as I could judge, the volume of the brook stream is about 20 to 1 of the sewage, and to this I attribute the fine quality of the grass. The dilution appears sufficient to enable the plants to feed without injury."

Again, when alluding to the town of Knighton, he adds—

"At the borough of *Knighton*, in Radnorshire, there is a great quantity of land in the valley of the Teme, and in the lateral brook valleys, irrigated with land-drainge water. The high lands from whence the water descends are scarcely cultivated, and the streams therefore contain little manure but the droppings of stock and game. No one would hesitate to drink the water. It is conducted in gutters along the sides of the slopes, with a less inclination than the river or brook from whence it was diverted, and then, by stopping its progress at the point where the irrigation is required, the water is poured over the surface in a thin sheet, for three or four days at a time. This is repeated several times in the course of the year. This irrigation is carried on to the utmost possible extent, and considerable expense has been incurred in forming the gutters. It is used only for grass crops, which are of a beautiful bright green colour, and form a most remarkable contrast to the pastures above the level. The crops are said to be double in quantity, and better in quality, and the value of the land more than doubled. The rent of land not irrigated varies from a few shillings per acre to about £2 in rare instances. The rent for irrigated land is £5 and £6 per acre."

Again, when speaking of Mileham, the birthplace of the great lawyer, Sir Edward Coke, he reports—

"At this place, in the county of Norfolk, a quantity of marsh and bog land was attached, in 1814, to a farm held by Mr. William Beck; this he reclaimed and brought into cultivation. It is now irrigated with brook water, which receives the refuse of the village of Mileham, and is worth a rental of £5 to £6 per acre. The meadow contains about 12 acres, and the whole cost of the reclaiming and irrigation works was from £400 to £500. The water is raised by a sluice, and the meadow is laid out in catch work of ridge and furrow: the water flows on the top of the ridges, and is carried off by the furrows. Adjoining land, unimproved, is let at the present time, for 11s. 6d. per acre."

That the weak impure waters of a London sewer possess considerable commercial value for the purpose of irrigation, is shown by the experience of "The Metropolitan Sewage Manure Company." This company is thus alluded to by Mr. Lee:—

"It has a station on the west bank of the Kensington Canal, at Stanley Bridge, where they have erected a steam-engine to pump the sewage water over the top of a stand pipe 75 feet high. This altitude gives a sufficient pressure for the whole district, and the fertilising fluid is conveyed from the stand-pipe and distributed, by about 15 miles of mains and services, varying from 14 inches diameter at the works, down to 2 inches diameter in the fields and gardens where it is used. The consumers have plugs fixed at convenient distances in their lands, and with their own servants, and hose and jet pipe, apply it when they please; paying to the company the sum of three pounds ten shillings per acre per annum.

"Hitherto the company has only taken the Walham Green sewer water, which contains probably less fertilizing matter than any other in the metropolis, in consequence of the less density of the population within its area. It is, however, the most conveniently accessible to the works. As soon as the arrangements for using the Ranelagh sewer water are complete, it is expected that still more beneficial results will be experienced. The first place I examined was a field from which two crops of grass have been taken during the year, and it is now a most excellent pasture.

"I examined the large marketgarden occupied by Mr. George Bagley, who said, in answer to my enquiries, 'I have found that all crops grow faster and are healthier from the application of sewer water. The size of vegetables is increased in a fine season; in some descriptions the quality is also better, and consequently they would obtain better prices. I may particularly mention vegetable marrow, a plant that requires much nutriment; it has produced a large crop in warm dry weather. In dry weather, the sewage is of great assistance to scarlet runners and French beans; but if rain were to come after its application, the consequence would be injurious. I have found it of great service to cucumbers, especially from the convenience of its application. I think, however, it is almost better for cabbage and broccoli than anything else. I have not perceived any offensive effluvia at the time of its application or afterwards—not enough: if there had been a little smell, the manure would perhaps have been better than it was.'

"Mr. Edward Bransgrove, manager of Mrs. Harwood's extensive market-gardens, said—'We have used the sewer water ever since the company commenced. The improvement in the plants is very manifest; I think it helps to lessen the blight. The growth of vegetable marrow is much improved, also of scarlet runners, and the same of lettuce and celery. This plot was celery, and the liquid manure was applied to it. After the crop was got off, it was planted with cabbage, without any further application of the sewage; but the plants are still benefited by the former application. The next patch of savoys had it applied to them about three months since, and are a very good crop. There was very little smell either at the time of its application or afterwards.' I likewise visited the market-gardens of Mr. William Bagley, Mr. Richard Steele, Mr. John Crouch, and Mr. Joshua Bagley, to all of which, as well as many others in the district, the sewage manure has been applied. In one place, a field of cabbage plants was pointed out, and I was informed that the sewage manure had been applied to about one-half and not to the other. Those to which it had been applied were darker in colour, larger, and much more vigorous than the remainder.

"I have already considered the objection urged in the provinces, that liquid manures could only be beneficially applied in wet weather, and have shown that the solution used was too strong. It is a remarkable fact, that the tenants of the Metropolitan Sewage Manure Company all concur in the statement, that the greatest advantages are produced by its application in dry weather, when manuring and watering are combined in the same operation. These facts, and my own experience, lead to the conclusion that the town sewage water should be collected and raised to the required altitude in as concentrated a condition as possible, but that it should be distributed and applied to the land in such a state of dilution with water as may be required by the season of the year, the state of the weather, and the quantity of moisture in the soil."

It is such practical facts as these which will well repay the careful study of many of the readers of this magazine. It is quite true that the foundation of all good husbandry is the removal of stagnant land water; but it is equally true that many are the instances where that land water, in its course to the nearest river, might be made to produce great and highly valuable crops of grass. For if such waters do not happen to possess in their *natural* state any enriching qualities, yet still we have seen, even by the evidence given in this paper, that both in Switzerland and in England, the addition to such poor waters of but a small portion of the drainage from inhabited places renders them available for the production of highly valuable supplies of grass.

ENGLISH AND SCOTCH FARMING.

BY M. M. M.

1. Report of a visit to the farms of Mr. Rigden, Sussex; Rev. Mr. Huxtable, Dorset; and Mr. Morton, Gloucestershire; with remarks on agricultural improvement by David Milne, Esq., of Milnegraden. Read to a meeting of the East Berwickshire Farmers' Club.—Berwick-on-Tweed Warder Office.
2. Tait's Edinburgh Magazine; article, "Tait *v.* Blackwood," No. 204.
3. Report of the Proceedings of the London Farmers' Club; Annual Meeting, 1851.
4. The Scotsman Newspaper for Jan. 22, 1851.

How frequently we find local feeling not only prejudice the mind against what is good, or amiable, or superior in others; but be jealous of any other party entertaining a doubt of that value or superiority. Not satisfied with the mere complacent feeling that gratifies the party himself, he wishes all others to have the same opinion; and though localities and circumstances and operations are continually changing their features, and this of necessity, still so deeply and so entirely will local prejudice shut up the avenues of light that on some occasions real advantage will be sacrificed, lest one jot of vantage ground is allowed to be conceded to a party considered an opponent purely because he resides in a different locality. *

If this be true of a parish—of a county—how much more is it of a nation? Nationality is the pride of the Briton, in which soever of the once four, now united kingdom, he may happen to be placed; and it is difficult to conceive a practice purely English, or Scottish, or Irish, or even Welsh, which is not admired and clung to *because it is such*, rather than because it is really valuable. Now while we would encourage a feeling of nationality even to a prejudice; while we are aware, half our patriotism is due to this or some allied feeling, we cannot sanction this to prevail to such an extent as to stand in the way of acknowledged improvement, but must remember the quaint advice of the well bandied adage—" Despise not the advice even of the meanest: the cackling of geese saved the Roman state."

Example, usually more powerful than precept, will not always overcome local prejudices. We see the three and four-horse-in-length teams in the south of England long after we might have thought example and science, and the diffusion of sound practice, had condemned it for ever. We see still the stubbles anything but fallowed in the autumn, although it has passed into an axiom that they should be cleaned in August and September, amongst well informed men; so that while some are getting in their swedes the others are busy cleaning and losing the truant moisture. How is this? We have always done so in our neighbourhood, and it will not answer to do otherwise. Ask a Norfolk man why he has wheels to his plough resembling those of a waggon, with the beam pointing up to heaven, and he will say no other kind is equal to them for their soils; and if you ask him why on his highest elevations he considers it necessary to put up a bank to defend his quickwood, he will say it is indispensable in his county, whatever it may be in Yorkshire. Ask a Nottinghamshire man why he does not ruckle his clover, or a Gloucestershire farmer why he does not tie up his barley in sheaves as well as his wheat, they will tell you most unhesitatingly, that it is not necessary in their districts, and they get it very well and less expensively without it.

Now while we would make all proper allowance for what is really under climatic and geological influences—and while we are ready to admit that these often so modify agricultural arrangements as to render general rules absolutely inapplicable under every circumstance, we cannot help feeling convinced that local prejudice often refuses to see the excellences of other practices, or the defects of its own, and consequently to adopt them, however valuable they may be.

In illustration of this we may mention a fact of a new agent being appointed to an ill-managed estate, from a distant county. He found the farming miserable, and suggested the necessity of various improvements to a tenant in his mode of cultivation. After patiently listening for some time, he at length exclaimed, unable any longer to contain his surprise and indignation—" Well, here is a thing! myself, my father, and my grandfather, have farmed this land all our lives, and here is a man from a distance, who sees it now for the first time, pretends to know how to manage it better than we do."

Twenty years ago we apprehend there would scarcely be a well informed practical farmer or land agent, who would not admit that, as a whole, Scotland—we mean agricultural cultivated Scotland—was better farmed than England. Whatever prejudices Dr. Johnson might have as to Scotland and the Scottish people—whatever may be said of their Highland sheep walks, stunted heather, and absence of trees—how much soever there may be of undrained and unimproved vale land bog, we do not think that it will for one moment be doubted that the character of the farming of the Lothians for instance, is of a very first-rate character, and has been so for years, and that many years ago it has been the pride of Scotland and the envy of England. " Scotland is well farmed, England is badly farmed. The latter pay less rent, they take less pains, they get less profits—they are slow, easy, slovenly farmers"—was a matter so generally understood that it was seldom questioned. They claim the same superiority now. Tait says, without a shadow of misgiving, without an if or but, states it as if it were to be received with as much implicit faith as if it were a deduction of Euclid: he says, "*not only is, for instance, Scotland better than England,* and Norfolk better than Dorset; but in every county, *at least every English county,* you have the best cultivation divided only by a fence or 'marsh' from the worst." Now never did a better instance occur of a writer unwittingly, at least in appearance, take the flattering unction to his soul that they were before us in farming. He does not attempt to prove or argue—he does not even raise the question—he gives the *fact* as an instance, and in the same category as he contrasts the best of English farming with the worst. Just as if he had said—we in Scotland know how to farm, we stand first in all that is superior in the art. We stand as far before you altogether, as the very best of your country's farming exceeds the very worst. Nay more, by implication he seems to convey the notion that there is no bad farming in Scotland; he mentions the fact that we have often good farming and bad with only a fence between; but lest it should be imagined that there was any of this bad in his favourite Scotland, he says "*at least* in England" —his statement holds good!

Not satisfied with this most insidious mode of putting forward his views—of stating the great superiority of the northmen as a matter to be invariably received, and universally admitted—he goes on to carry out his hypothesis as if it were all taken for granted. " The most formidable competitors," talking of home competition, he says, "of the bad or jog-trot unimproving farmer, were the good farmers who increased production and diminished cost. The Lothians, rather than Poland, have been the chief competitors of Dorset and Sussex." Here again is the same take-for-granted inuendo. The English farmers are "bad, jog-trot, and unimproving," the Scottish are the "good farmers, who increase production and diminish cost."

Now this is the whole pinch of the question. Is this so, or is it not? Mr. Pusey, a man who knows what he is about, who has no Scottish antipathies, who does not fear nor fail to expose English errors, says their superiority as a whole is not so enormous. Nor is it a remark arrived at yesterday. So long ago as 1842, Mr. Pusey thus writes on Scottish farming, *R. A. S. Journal*, vol. 4, p. 289:—"In Scotland, 30 miles beyond Berwick, arriving at Dunbar, you find, along the sea-coast, some of the famous farms of East Lothian. It is an extraordinary soil, for which the tenants, farming admirably, pay the well-known rents of £4 or £5 the acre, which some suppose to be the common rents of East Lothian; but ride two or three miles only inland, and you find, first, land well farmed at £2 an acre; then land at £1 per acre—some of it very ill-farmed, foul, and out of condition; then the Lammermoor hills, which are not farmed at all, but are in the same state as Lincoln Heath when the Dunston beacon was lighted nightly. Onwards again to Edinburgh, for 30 miles through the Lothians, you will see good land most excellently farmed; but sometimes also moderate land in a very slovenly state. If from thence you travel along the mail-coach road to Carlisle, on losing sight of Edinburgh Castle, you pass for 70 miles through the heart of South Scotland, over moors covered with a rank grass, which shows that they might bear something better, or among scanty corn crops, which prove that nature has been little assisted by art. I cannot, therefore, place the general farming of Southern Scotland, or of Northumberland, on a level with the farming of our southern counties, such as Buckinghamshire, but rather with that of North Devon; nor the general farming of East Lothian on a level with the general farming of Lincolnshire; nor the best farming of East Lothian on a level with the best farming of Lincolnshire, because it is the best land only of East Lothian on which such noble examples of farming are given, while in Lincolnshire the barren heath and wold have been taught nearly equal luxuriance."

Now if we rightly understand this statement, which, wide as was its circulation, excited no surprise, no animadversion, no denial, it amounts to this, that, though there is some very good farming in Scotland, there is also some very bad; and that, though the Lothians being very superior land are extremely well cultivated yet there are very badly cultivated lands not far off, and that it is as in Scotland so in England—some districts are everything they should be, and some are everything they should not; and therefore any particular boast of any particular country may refer more to its most favoured portions than to any general superiority in its farming on the aggregate. So long ago as 1821 Sir John Sinclair says, "Nothing but a personal inspection of the crops grown in Berwickshire and the Lothians can give an adequate idea of the perfection to which the fallow system is brought in those districts—of the immense crops produced after it—nor of the advantages which are derived from a well-conducted fallow, by the subsequent crops in the rotation." He further on quotes the opinion of Mr. Curwen, M.P., who, speaking of the Lothians, also says, "that clay soils subject to this process (fallowing) will produce the greatest crops, and yield the highest rents, of perhaps any in the United Kingdom."

Now this statement, admitting the superiority not of Scottish farming generally by any means, but of the great productiveness of the soils of Berwickshire and the Lothians—dovetails exactly with Mr. Pusey's statement, and that which at first might be supposed to speak for some general Scottish superiority in farming, is nothing more than a proof of the great fertility of the two districts named by that great authority.

Nor is the entire palm given to Scottish agriculture by many other authorities. We will cite but one more, because it was a public and official one, circulated under the superintendence of a society constituted for the purpose of diffusing useful knowledge, and which was subjected to the searching scrutiny of the practical eye of the late lamented Earl Spencer—we mean "British Husbandry." There the writer says, vol. 1, p. 33, in quoting Mr. Loch in his appendix to the account of the improvements of the Marquis of Stafford: "The rapid success in improvement so visible in *certain districts* of Scotland, has led rather too rapidly to the conclusion not only that the Scotch are decidedly better farmers than their English brethren, but that the latter are in fact but indifferent husbandmen. Nothing can be so totally without foundation. That a considerable portion of England might be better farmed than it is may be true, but it would be a matter of astonishment in a country cultivated as this country is, from one end of it to the other, if much indifferent farming did not prevail. There is no country where so many valuable practices exist—many unknown to the agriculturists of the north, and well worthy of their consideration and adoption."

Now this carefully analyzed is anything but a statement of the vast superiority of Scottish over English farming—nay, it is just the reverse, *some districts* are cultivated well in Scotland, but all may learn many things from many of the practices adopted in England—a state of things very far from any extensive or very decided superiority.

Let it be remembered that the soil of the Lothians is specially adapted to develop ordinary farming—it is just porous enough to allow the escape of an undue quantity of water—it is tenacious enough to keep solidified, and to sustain the roots of plants—it has loam enough to render it friable and easy to work, and yet is sufficiently strong to prevent the rapid growth of root weeds—it is clayey enough to retain manure applied to it, and sandy enough to admit of the sheep consuming the turnips; and therefore it is everything that could be wished for mechanically, and, above all, it is a very deep soil with a rich subsoil. On soils like this there is no skill to farm well, the difficulty would almost be to farm ill; and because in the Lothians and in Berwickshire there exists a couple of districts of superior land and well farmed—ergo, the Scotch are better farmers than the English.

But to show that it is to the soil that this is attributable, we need only appeal to the recent analysis of Mr. Anderson, the chemist of the Highland Society, who has analysed a Lothian soil, and he thus gives the results per cent. :—

	Parts.
Silica	74.3927
Per-oxide of iron	4.7180
Alumina	5.5440
Lime	1.3913
Magnesia	0.7468
Potash	1.7142
Soda	0.6788
Sulphuric acid	0.1006
Phosphoric acid	0.1460
Chlorine	0.0068
Organic matter	6.3271
Water	4.4260
	100.2923

Now if we take an ordinary wheat soil in Yorkshire we have this analysis :—

Soil from near York; grows good samples of wheat.

	Parts.
Silica	78.40
Oxide of iron	3.00
Alumina	5.00
Carbonates of lime and magnesia	1.80
Potash	0.80
Phosphate of lime	0.10
Sulphate of lime	0.20
Chloride of sodium	trace
Organic matter	0.20
Water	10.00
Loss	.50
	100.

Now it does not need a chemist to see the vast inferiority of the one soil on the other. As to silica they are much alike; as to organic matter there is a difference of more than five per cent.; of potash a difference of nearly one per cent.; of phosphoric acid of more than one-half per cent.—in short the one is rich and the other poor in all the elements necessary to grow corn and every kind of crop; and we suppose a traveller passing the one by a railroad in Yorkshire, would exclaim, What a slovenly farmer! and by another through the Lothians, would say, What splendid farming! how far the Scotch exceed the English in their agriculture!

But we might put the point in a more striking light even still. The depth of a soil has everything to do with its crop growing; it makes thousands of tons in a field difference in all the corn-growing elements between a soil one foot and a soil two feet deep. When a soil is deep it has what we may technically call a good subsoil; when it is not, it has a bad subsoil. Now we will take again the Lothian subsoil and compare it with the Yorkshire subsoil, though from a little difference in the arrangement of the component elements, we cannot very conveniently place them side by side. First we take Dr. Anderson's Lothian subsoil.

Lothian subsoil.

	Parts.
Silica	73.6416
Peroxide of iron	4.9230
Alumina	9.3830
Lime	0.7189
Magnesia	0.8489
Potash	0.1540
Soda	0.0367
Sulphuric acid	0.2060
Phosphoric acid	0.1640
Chlorine	0.0060
Organic matter	5.8554
Water	4.2810
	100.2185

Here is a subsoil vastly superior to the soil itself from York, and hence how far the two subsoils will vary the following analysis will show.

Yorkshire subsoil.

	Parts.
Silica	63.00
Oxide of iron	10.50
Alumina	11.00
Carbonate of lime and magnesia	1.70
Phosphate of lime	trace
Potash	2.00
Sulphate of lime	0.20
Organic matter	0.40
Water	10.50
Loss	.70
	100.

Thus excepting the potash, which in this case exists in the subsoil in a much greater degree than even in the soil itself, owing possibly to its existence in the parent rock from whence the soil was formed—the subsoil of the Yorkshire land is as inferior, if not more so, than the soil itself is to the Lothian soil. Nay more, the Lothian subsoil is to all intents and purposes richer than the Yorkshire soil. Well may they farm well on such a substratum, and with such overwhelming advantages!

Well says Professor Anderson in the review of the analyses of these soils—"The nitrogen is another constituent of which the quantity must be considered as comparatively very large. Thus we have in the Carse soil as much as 0.2 per cent. The actually large amount of this quantity may not be apparent when it is expressed in fractions of a per cent.; we must bear in mind that the weight of the soil ten inches deep on an acre is, in round numbers, about a thousand tons, and that quantity will contain about two tons of nitrogen. It will further serve to illustrate its abundance to mention that a crop of wheat, amounting to thirty-six bushels, with straw, contains about fifty-two pounds of nitrogen, and a crop of twenty tons of Swedish turnips only about thirty-six pounds. By a similar comparison it will be found that all the other constituents are present in equally abundant quantities.

"From the analyses detailed two conclusions may be drawn in regard to these soils: first, that they all contain, in large quantity, the whole of the substances necessary for the food of wheat and other plants, in a condition in which they are fitted to be taken up by the plant; secondly, that they may be divided into two classes, the one characterised by the absence of, or small amount of, alkalies in the insoluble matter—the other by the abundance of these constituents. Theory points to the superiority of these latter soils over the former—a superiority which practice has long established; for I believe it will be admitted that the soils of the Carse of Gowrie and East Lothian greatly surpass all the other wheat soils of Scotland in fertility."

It is not surprising, therefore—it would be very surprising if it were otherwise—that the soil of East Lothian being very excellent, the farming is excellent also, and unless and until similar soils are taken as specimens in England, it is not fair nor reasonable to draw invidious comparisons between the agriculture of the two countries, to the great disparagement of England and her farming. Nobody will deny that in England there is moderate farming and bad farming, and in some cases even in our best counties there is no farming whatever. There is no earthly reason why the land in Norfolk, in Nottinghamshire, and elsewhere should not be at once made into such convertible land; but it must be admitted that the same fact applies also to Scotland, and we know of no mode of escaping the charge for the one country or the other.

If we take, moreover, McCulloch's estimate to be correct, we shall find 3,390,000 acres in Scotland in crop out of 18,994,000 acres; and in England and Wales 13,300,000 out of 36,999,680 acres; so that if this is taken as any criterion there is a larger proportion of cultivated land growing crop in England and Wales than in Scotland.

Such may be said to have been the state of things when Mr. Pusey's speech, at the annual meeting of the London Farmers' Club, brought about his ears no little severity of animadversion. A Scottish gentleman confessedly threw down the gauntlet. He had been over Norfolk—"A chiel was amang them taking notes, and faith—he—prent it."

Mr. Pusey, identified as he is with the English farmer, editing and conducting the *Journal of the Royal Agricultural Society of England*, felt himself annoyed and libelled by the insinuations of the vast superiority of the Scottish over the English farming, and thus gave vent to his feelings at the convivial meeting—the annual dinner—of the London Farmers' Club. After alluding to the fact we have just named, he said—"He had travelled in Scotland himself, with a determination to look into the matter, and drove his own horses through twenty or thirty miles a day. He saw along the sea-coast some wonderfully fine, deep, red land, very well farmed; but having horses with him he left the sea-side, and rode up to the hills. There he first found very indifferent farming, then bad farming, and on the tops of the hills no farming at all (laughter). On this subject, as he did not wish them to rely upon his opinion, he would read to them that of an old farmer who afterwards turned politician—the opinion of Oliver Cromwell, who began life as a farmer and grazier at Huntingdon. On the 25th of September, 1650, he wrote thus to the Lord President of the Council—'I thought I should have found in Scotland a conscientious people and a barren country. About Edinburgh it is as fertile for corn as any part of England:' and such was his (Mr. Pusey's) opinion of the land. About one hundred years afterwards, Dr. Johnson, who wrote a great dictionary, and was half blind, and living in Bolt-court, Fleet-street, of course did not know anything about land, wrote from Edinburgh, that he never saw finer land in his life. It must have been very good to have struck him. His lamented friend, the late Lord Leicester, said the Scotch must be very much afraid of their wheat, as they allowed so many docks to grow up to support it (laughter). When in Scotland, he (Mr. Pusey) saw a great deal of land that was entirely out of cultivation. He would not pursue the subject. If the Scotch would let them alone, they would let the Scotch alone; but so long as the Scotch went on boasting of the superiority of Scotch farming, he would declare his belief that that superiority was as gross a humbug as was ever palmed by the vanity of one nation upon the credulity of another."

Now there is really nothing new in this. There is no new opinion broached. Mr. Pusey has said nothing in this speech which he had not said years before in his remarks on the farming of Lincolnshire, and there is no reason why so much objection should now be taken to what was pretty patent before.

And if he did not coincide with the commissioner, who considered that because land in the East Lothians sold for forty years' purchase, and only for thirty in Norfolk, that therefore the former was better cultivated than the latter, we do not see how he avoided it; if anything, it seemed as he stated to tell a different tale. It appeared as if purchasers saw that there was sufficient room in the Lothians to improve their farms, and therefore they were worth a great number of years' purchase; while that in Norfolk the land had been as much as it could be improved, and therefore it was worth less years' purchase.

Mr. Pusey well knew how safe he was in pursuing the wily Scotsman down to that county. The high hedge-banks, and the unwieldly-looking plough wheels, might be shocking to the eyes of a Scotsman, and the whole of the one, and a part of the other, might possibly have been dispensed with to advantage. The northmen might look at the ploughs there with wheels of three feet diameter, and with beams pointing up to heaven, and say how much more lumber does this plough carry than our own delightful swing, and it may be so that they do; but did he happen to reflect that the dynamometer, the safest and best of all tests, has shown—not that the wheels are an incubus to be dragged about, but they are an absolute relief to the horses—that other things being equal, the wheel-plough will require a less draught than the swing, not to mention the vast superiority where the ploughman is not fully up to the secrets of his art.

But for turnips, for stock-feeding, for barley—aye, in East Norfolk, for wheat too, though the soil is less calculated for wheat than the celebrated East Lothian soil—we do not think Mr. Caird himself could point to a district even in Scotland its equal. He admits the vast improvements of Lord Leicester to be beyond all praise; he is equally unsparing of those of Mr. Hudson, of Castleacre; and we are much mistaken if he can match in Scotland, all in all, either the one or the other.

Whether they make a profit or not we will not venture now to say—how far they are able to stand the fearful pressure we know not—but they are doing as well, we opine, as the farm at Auchness is, if divested of its product of potatoes.

The Scotsmen finding themselves thus put on their defence come very boldly to the onslaught, armed with the periodical articles of the *Times* Commissioner. This is the celebrated Mr. Caird, of Baldoon, whose high farming excited such wonder, and whose facts were so harrowed and pulverised by the magazine of the north—his own country's Blackwood. Mr. Cowie, who writes in the *Scotsman*, makes a special selection of all Mr. Caird saw which was bad in the worst cultivated districts of England: he draws in the stubble draining, the three-horse-length ploughing, the clumsy ploughs, and the bad farm buildings, raked out of Mr. Caird's successive letters in the *Times*; and then declares that England is a shockingly badly cultivated country. Now all this may be very good in a letter in an ephemeral newspaper—it may take for the moment, but it by no means proves a single position he has taken, nay it is altogether unworthy the brains of a hard-headed Scotsman to imagine that any such feeble reasoning can improve the impression left by Mr. Pusey's speech, which after all is unanswered. He says "We have not provoked this contest: we are not our own trumpeters," and declares that it is because then blood is up (we thought "Scotch bluid" was more calculated to get up than English), and so we are jealous at their superiority. Now if Mr. Cowie had coolly read Mr. Pusey's speech, he would have arrived just at the opposite conclusion; that gentleman volunteered no attack, he merely defended the character of the English farmer from the imputations cast upon him by the Scotsman travelling in Norfolk, and remarking on the superiority of Scottish farming in an English newspaper. Mr. Pusey may therefore retort upon Mr. Cowie, and say—"We have provoked no contest—we are not our own trumpeters—but your 'bluid' is up with the spirit of jealousy at being no match for *us*." Mr. Cowie lashes Mr. Pusey in this style:—"If it so happens," he says, "that a stranger previously acquainted with English farming, in passing through Scotland, finds science in combination with practice the rule with us, and the exception among our neighbours; if he here finds threshing-mills as common as roads and bridges, and among them as rare as earthquakes and water-kelpies; if he finds us draining and manuring well, and they in general doing neither; and if he chooses to go and publish what he has seen, and if, instead of benefiting by such information (like their leader Mr. Pusey), their blood gets up, the spirit of jealousy is roused among them, because they are not our match; the misfortune and fault rest not with us. We have made no invidious comparisons, nor boasted of our superiority; but when assailed (as we have been by Mr. Pusey and others, and the laurels we have gained attempted to be snatched from our brow) we are not the men to stand silently by and shrink from the combat. We envy what nature has bestowed in her rich profusion on our neighbours—their good climate, their rich soil; but we wish them joy of what art they possess—of their wooden and thatched houses, their forty feet wide hedge-rows, and their stubble drains. And, finally, to show our good-will towards them, we hope to see the day when, with the superior natural advantages they possess, they may soon shoot as far ahead of us as they are at present in the rear."

Now while we are willing to allow with impunity a fair share of national vanity, while we can admire and even love a true spirit of nationality—an attachment to home and a sense of advantages we possess over our neighbours—whether it be the Italian pluming himself on his etherial sky, or the Greenlander praising his libations of oil—we think a degree of self-sufficient vanity is displayed in the passage we have quoted which exceeds all allowance, apology, or excuse.

We do not admit, we have no proof that good farming is the rule in Scotland as much as it is the exception here—we have no statistics of the number of threshing-machines being co-extensive with the number of roads there, nor deficient as earthquakes here—we know, we think, a little of draining and manuring as well as they, and we have a right to demand proof of all these facts before we can admit them. Nay, if all this be true, if it be true of the very best cultivated part of Scotland, how did it happen that the members of the Haddington Farmers' Club did not accede to the challenge of Mr. Pusey, to show three Scottish against three English farms? How? why but because they felt they had no chance of beating them, and they preferred rather to keep their own inflated sense of their own superiority than allow the shine to be taken off them by their English competitors.

In the thick of this controversy we turn to the pamphlet numbered one on the list at the head of this paper, and a most valuable document it is, from the pen of a distinguished Scotsman, a scientific observer, a gentleman of professed judgment and skill, and a director also of the Highland and Agricultural Society of Scotland, and living in some of the best cultivated districts of that country. He makes a tour in England for the purpose of seeing and learning, and it is only little minds which can learn no more. He visits a farm in the south, a farm in the east, and a farm in the west of the island, and reports the results of his experience to the members of the East Berwickshire Farmers' Club.

There is a modesty and candour in the pamphlet very different from the vauntings of the hero in the *Scotsman;* but it is easy to see that even Mr. David Milne himself has exalted notions of the superiority of the Scottish agriculturists. The more is this evident from the fact that it leaks out almost by implication rather than as a broad statement, and hence we see not that he wishes to force out the idea as something which he wishes to promulgate, but rather alludes to it as an admitted axiom, the more showing the general feeling which prevails in the north on the superiority of the Scottish agriculturist. He says, "In Scotland, if the husbandry is not superior to that in England, at all events more is made of the land, and higher rents are paid for it. I believe one chief reason for this undoubted fact to be that, generally speaking, in Scotland more capital is brought to bear on the business of farming than in England—more being expended by landlords in drainage and in convenient farm offices—more being expended also by tenants, elicited by the security of a nineteen years' lease. This remark, if well founded, ought to encourage a further advance of capital by both parties, if it be within their power. But, in speaking of the superiority of Scotch farming, let me not be understood as attributing it to capital alone." We will not pursue his argument, nor his reasoning on the causes, because it is beyond our object; but it is perfectly manifest that he has gone through his tour prepossessed with a notion of the superiority of the farming of Scotland to that of England.

Still he is not blind to manifest excellence. The gentle and modest and quiet way in which he puts the points to the Berwickshire farmers shows that he does not believe in their universal superiority. He says, "These remarks," alluding to the main features of the management of the farms he had visited, viz., their heavy manuring, deep ploughing, complete pulverization of the soil, and shed-feeding of the stock in the place of pasturing, "at once suggest to us the inquiry why a similar system of farming should not be followed in Berwickshire? If our processes of husbandry and of stock-feeding are better, of course that is a sufficient reason. But, before this answer can be given, the merits of the two systems ought to be respectively considered. Far be it from me to venture on such a comparison. This is a task from which my inexperience wholly unfits me; but I will venture to notice one or two points, in the hope simply of inviting discussion of the subject by the practical members of the club."

Risking, as this course may be, of exciting the prejudices of the club, he perseveres in the attempt, and his able pamphlet is the result. Mr. Milne commences by citing the instances in which the occupiers of the three farms he visited exceed, in his opinion, the practice of the Berwickshire farmers; and in so far as Mr. Rigden, in Sussex, Mr. Huxtable, in Dorsetshire, and Mr. Morton, in Gloucestershire, agree in these points, he thinks they are before the Berwickshire farmers.

1st. *As to their cropping.* He adduces two very important facts. First, that the English farmers he names have a great variety of green crops, and are thus enabled to vary and change the crop in all possible ways; and, secondly, that they do not persevere in the five-course system at all hazards and at every loss, but change and vary to suit the circumstances, and thus, in the one instance, secure a much better chance of a crop than when the cultivator is confined perhaps to turnips and clover. Mr. Rigden, for instance, grows turnips, swedes, mangold wurtzel, carrots, potatoes, cabbages, clover, ryegrass, sainfoin, lucerne, tares, rape, and rye; whereas, in Scotland scarcely one half that number is cultivated: hence the land is clover-sick. He traces the disease back so far as 1776, and shows that the Berwickshire farmers still persevere in a system which is so very unproductive that, in Berwickshire and Roxburghshire, the second year's crop of grass is not worth more than 35s. per acre. Now this may be allowing the land to rest from corn; aye, it is nearly allowing it to rest from everything else.

Now, if we mistake not, this is a case where few decent English farmers do not exceed the Scotch. There are but a very small number who would like to be in the predicament of paying rent, tithe, and taxes on moderately good land, and, in any year, produced a crop worth only 35s. per acre. And Mr. Milne wisely and truthfully states that, whatever reason there might be years ago for this two years' depasturation of the artificial grasses, when manure was scarce and out of the reach of the inland farmer, it cannot be so now.

Then, if we take into account the vast superiority of Scotland to the south of England at least, for the growth of green crops—the moisture of its fertilizing clouds—we ought to have seen the variety there of green crops; rather than have adapted one for cattle and one for sheep, one for spring and one for autumn, one for producing fat and another for keeping stock, one useful for milk and cheese and another for butter; and yet it is the very reverse.

But Mr. Milne further reminds the club that they are excelled in the culture of the soil by the southerners. There was not only more working—more æration and exposure—but the result of it showed itself in a finer pulverization, and the so prepared soil had a supply of manure unheard of in Scotland. Mr. Rigden applied to 740 acres as much as 9,000 tons of manure per annum, and was not satisfied with manuring for one crop in the five years, but carried on the process, and lays on, on every acre of his farm, on an annual average, something like twelve tons of manure. Mr. Milne concludes this head by saying, "It is his practice, and that of the most intelligent farmers in England, to manure for all their crops, corn, grass, and green crops." He thus contrasts the farming of Berwickshire:—"It thus appears that our land generally receives only one-third or one-fourth of the manure which, on the English farms referred to, is applied. I merely notice this fact. I presume to offer no opinion as to which system is the best; I leave this point also to be considered and discussed by the practical members of the club." (p. 45.)

Having thus contrasted the best practices of Scotland with those of England, fully and ably carried out in the two important particulars of crops and cultivation, he next proceeds to point out their superiority in the management of their stock. He alludes to the stall and box feeding of England, shows the necessity and value of warmth and shelter, of equal and unmolested feeding, and of the cleanliness of the one practice as compared with the other. But he goes on further to show that, not only are the cattle but the sheep also protected and aided by the same process, and the advantage, he goes on to say, is found in the increase of mutton and the improvement of the wool.

But, in Berwickshire, the refuge of the cattle is simply the shed in which they may, if they choose, take shelter, but they are altogether in a condition so different that they are in circumstances much less favourable for fattening speedily and cheaply than if more care were taken to prevent them roaming—to screen them from the extremes of the weather—to prevent their annoying and goring each other, and to promote the healthy cleanliness of their skins. And if the same class of cattle are to be fed, there is no doubt that the Scottish system is wasteful, and slovenly, and bad.

To take a gentle domesticated animal, like a short horn, for instance, to expose it to the cold and wet—the snow, and frost, and sleet—you are setting it to burn up the carbon on which you feed it for nothing, not to mention the liability to disease induced by pursuing a practice so objectionable.

But with the Highland Scot, when it is fed, it is different. His hardy constitution is calculated to resist the influences of the weather, and he would fret and vex himself more by his confinement and isolation than any advantage which could accrue from exposure, such as is the case on the Berwickshire farms. Hence this exception is necessary to be pleaded; but when the same class of animals, short-horn Hereford or Devon, are to be fatted, there is no doubt whatever that Mr. Milne is strictly correct in stating how far behind is the Scotsman in the feeding of his cattle. And if the English farmer grows a much greater variety of crops, he can give to his cattle a much greater variety of food. Nor is the change of crops more useful, nor more necessary to the land, than is a change of food to the fattening animal.

If we take the food on which the English farmer feeds his cattle, it is almost one endless catalogue. He has twenty kinds of food, green and dry, in twenty kinds of combination. He has turnips, sweedes, meadow-hay, linseed, cooked, bean and pea meal, barley and oat meal, oilcake, chopped straw, mangolds, and a list of other adjuncts which we will not stop to mention; and how different is this to the unchanging turnips and hay from the artificial grasses we will not stop to investigate.

But the most fearful charge of mismanagement adduced by Mr. Milne against the Scottish farmer is his *want of economy,* in that most important point of all, in his manure. Now, whatever may be said as to the comparative merits of the farming of the two countries, now happily one on points of minor consequence, we apprehend no one will question that this is a vital point. A man may be penny wise in other things, but if he neglect this he is undoubtedly pound foolish. If Mr. Milne cannot be contradicted in his apposite and striking remark on this point, we fear he will make out a case by far too difficult for his Berwickshire farmers, and one which will for ever settle the question of the superiority of Scottish farming.

He says, "How few farms are there in our county where there is such a thing as a tank to collect the liquid which flows from our stables, byres, pigsties, cattle-sheds, and dung heaps?"

This Mr. Milne properly describes as a cause of these good English farmers having so much more manure to lay on their farms; they preserve the liquid in one way or other, and make it available for the production of crops; these crops are carefully consumed by sheltered stock, all their liquid excrements are again collected and applied so that an ever continuous chain is being carried round in the manufacture of manure, of crops, and of food.

Nay, not satisfied with this severe animadversion, the reporter goes on to say that the Scottish mode of making manure is also objectionable; it is allowed to evaporate in the air, and to subside in the drains; the elements of roots and corn are dissipated and lost, both in the yards and in the field, and no efficient plan is in operation to prevent its escape, or to turn it to advantage in its progress.

How different on the three English farms, the management of which he has reported! We can not half so graphically describe Mr. Huxtable's process as he does in his own clear and forcible language. He says, p. 32, "The liquid manure thus collected," *i. e.,* by tanks and fixation, "is made use of in several ways. It is applied, in moist weather, to the clover and Italian ryegrass, and other green crops of that description, after they are cut, which causes them to spring up again immediately with rapid luxuriance.

"This irrigation is effected on the hill farm by small carts, constructed in the form of boxes, on broad wheels, which cost about £10, and on the vale farm by pipes, which are laid down from the tanks, and radiate out to different parts of the farm, at an expense of 1s. per yard. By these pipes Mr. Huxtable manures his 90 acres with liquid manure, at a cost of £70 10s. annually, or about 15s. 6d. per acre. Another way in which this liquid is applied is in the making of compounds with bones, ashes, clay, and other absorbents, and also in enriching the dung formed by the litter or beddings of the stock."

The care of the liquid manure may appear less on Mr. Morton's farm, but it really is not so. The one preserves and applies it carefully when made, the other prevents it ever taking the liquid form at all, by feeding his cattle in boxes. The trampling, the closeness, and the position of the boxes being sunk into the ground, prevent this waste ever taking place; and in situations where the whole of the litter is chopped, so as to prevent the necessity for any field fermentation, the whole of the liquid is preserved. Thus, with much more ease, with no expense, and with erections as inexpensive as it is possible to conceive (Mr. Warnes' estimate is £2 10s. each), the whole of this vast loss of manure is saved without the slightest difficulty.

Mr. Rigden is also careful of his liquid manure. "The liquid manure from the tank is used two ways. After the clover or lucerne is cut, a quantity is spread over the land by means of a barrel. When not used this way it is applied by being poured over the dung-heap." Now, taking which view we may, whether this essence of the manure is to be prevented from escaping or is to be secured afterwards, whether applied directly by the pipes or the water-cart, or indirectly by the manure or the compost, it is quite clear that no man, Scotsman or Englishman, can lay claim to be considered a good farmer who does not preserve his liquid manure.

On the feeding of stock, Mr. Milne again goes on to say that the southerners are before their neighbours. And he not inaptly adduces the case of soiling the green crops. That the consumption of green crops on the land is accompanied by soiling and by waste it is impossible to deny. There is much soiled and trampled upon—much injured, and its growth suspended by the bite of the cattle—and one in three may be fed more if the soiling system is adopted. We are speaking of cattle and horses. It is doubtless an expense; but, if the crop be abundant, if the land be near the feeding place, it will most certainly repay the expense. We are speaking of cattle. We are not certain that house feeding and soiling for sheep is ever a profitable process.

To show the relative advantages of the two modes, Mr. Milne contrasts the cost of Mr. Nicholson's calf feeding in Scotland (of Lennel Hill) and Mr. Huxtable's.

EXPENSE OF REARING A CALF.

By Mr. Nicholson.	£	s.	d.
45 days' milk, four quarts, at 1½d.	1	2	6
Mixture of wheat and linseed-meal gruel, four quarts, at ½d.	0	7	6
45 days of this mixture, but in double quantity	0	15	0
Hay, cake, and turnips, at 1d.	0	3	9
Grass, from first of June to 15th October, at 10d. per week..................	0	15	10
Second summer's grass..............	2	0	0
90 days' oilcake, 3 lbs. daily, at £7 per ton	0	16	8
Price of calf, bought	1	10	0
Loss from death, at 10 per cent., or £6 13s. 7d.	0	13	0
Attendance for two years	1	0	0
	£9	4	3

During the first winter—210 days—6½ tons of turnips would be consumed, at the rate of 70 lbs. daily; and during the second winter—215 days—17½ tons, at the rate of 182 lbs. daily.

The animal, after the above feeding, would be two years and three months old, weighing probably fifty-four stones, which, at 5d. per lb. (live weight), would yield £15 15s.; hence there would be a surplus of £6 10s. 9d. to pay for twenty-four tons of turnips, at 5s. 10d. per ton.

By Mr. Huxtable.	£	s.	d.	£	s.	d.
Two quarts daily of new milk, at 1½d., for a week	0	1	9			
Six quarts daily skim milk ..	0	1	3¾			
	0	3	0¾			
			4			
First months cost..........				0	12	3
One quart daily of new milk	0	0	10½			
Five quarts of skim	0	1	6¼			
½ lb. oilcake daily..........	0	0	3			
	0	2	7¾			
			4			
Second month cost				0	10	7
From 3rd to 12th month, 150 lbs. of cake, at £7 per ton				£2	15	0
During last six months of second year, 2 lbs. of bean-meal daily				1	2	0
Attendance for two years				1	14	10
Calf born on farm, price if then sold ..				0	9	0
				£7	13	8

From the third to the twelfth month—309 days—3½ tons of mangolds would be consumed, at the rate of 25 lbs. daily; and in second year—365 days—8 tons, at the rate of 50 lbs. daily.

The animal, after the above feeding, would be two years old, weighing probably 36 scores (or 51 stones) dead weight, which, at 5d. per lb., would yield £15; hence there would be a surplus of £7 6s. 4d. to pay for 11½ tons of mangolds, at 12s. 8d. per ton.

Mr. Milne very properly asks, are these things so, and if so, are we not behind hand? He cautiously takes no side. He asks a searching question, and leaves the common sense of his well read and keen sighted countrymen to supply the answer.

He goes on, however, in the way of suggestion, to offer several very important and valuable remarks which will be thoughtfully pondered over, and which are not easily answered by a thinking man, nor can they be evaded by a sneer.

He urges these plans, not as a vague experiment adopted in moments of fitful vagary, not as an ephemeral trial of a day, as was the Auchness case, an instance of extreme profit from the successful cultivation there of a crop failing elsewhere, but he asks what, in soil or climate or circumstances, should render Berwickshire less fit for the system than England. The farmers are capable of managing a four-course shift as well as a five—they would grow more green crops. Why, he asks very properly, cannot they grow cabbages and mangel? It is not too far south, for they are grown in England; it is not too far north, for they are grown in Roxburghshire and in Forfarshire; and he ends his inquiry with this almost self-evident truth: "It is surely a right principle to have a variety of green crops, for the sake of the land, for the sake of the stock, for the sake of the farmer, so that, if calamity occurs to one crop, it may be compensated by the safety and abundance of another."

We shall allude but to one other fact which he states in corroboration of his views, and that is, his reply to the objection that the application of so much manure to the soils of Scotland would be injurious to the farmer, and cause the crops to lodge. Mr. Rigden applies 32 tons per acre to his wheat, but it is after his pulled off crops; while to green or root crops they apply 40 tons per acre. The

Berwickshire farmers (Mr. Milne challenges them) do not give more than 16 tons to the roots, but less if an application is given of bones or guano. But he gives samples of high manuring in Scotland to show that this is a delusive fear.

He gives the following succession of manuring to show to what an extent the principle may be carried.

1st year—Grass; 2 cwt. Peruvian guano per acre.

2nd year—Oats; 30 loads of compost, and 18 barrels of refuse fish.

3rd year—Turnips; 30 loads farm-yard dung, 2 cwt. of guano, and 20 loads of sea-weed.

4th year—Barley; 20 loads of compost, and 16 barrels of fish refuse.

The crops, so far from being injured, were—

1st year—300 stones of clover.

2nd year—72 bushels of oats.

3rd year—25 tons turnips.

4th year—60 bushels of barley.

We need not further follow the able reporter. He makes out a case of defective practices in Scottish farming which are not easily got over, not in any other than the best spirit and for their good; and it is infinitely better to do so than to close the ear to truth for the sake of any national jealousy.

Now Mr. Milne publishes this, and circulates it amongst the intelligent, far-seeing, and hard-headed Scotsmen. It goes before the East Berwickshire farmers' club. And how is it received? In every way as it deserved by the gentlemen of the meeting; and while all but one are silent as to its truths, that gentleman admits the force of very much that Mr. Milne remarks of the Berwickshire practice, and not least does he admit that most important of all statements, that they are generally deficient in the care they bestow on their liquid manure. He candidly acknowledges that, "Whatever may be done by individuals, I am quite aware of the fact that *generally over this district* this valuable portion of the manure produced upon our farms is entirely lost." So says Mr. Wilson, of Edington Mains—the remainder of whose speech shows that there need not be a more far-seeing man—and if he could have escaped the animadversions of Mr. Milne, he is the very man who would have done it with ability. How, then, does he get out of the dilemma? Why, he confesses the Scotsmen do not know how to apply it. The important problem of the profitable application of liquid manure, he says, has yet to be solved. Can this be possible?

Is it a problem unsolved that box-made manure is richer than that which is exposed and drained and evaporated? Is it a problem that a clay compost will absorb its best parts; nay, is it a problem whether this manure has in fifty ways been profitably employed? We cannot help thinking that here at least the English have a verdict; for, though all do not preserve their liquid manure, the waste cannot be said, in any moderately farmed district, to be general.

On the stock-feeding charges contained in the pamphlet Mr. Wilson is also equally plain. He confesses that the management in this respect was superior to that of Berwickshire. And as this is not a mode of management peculiar to the three farms which Mr. Milne has visited, but is common to nearly the entire country, we suppose it will also be admitted that the Scots are again behind us. It is a difference as to shelter and as to food. Mr. Wilson confesses with trying the experiment on two bullocks, and it answered his expectations in every way. Nor does he think it necessary to give to the animals so many turnips; so many of one kind of vegetable, he means, as is done in Scotland—at least, in Berwickshire. Had he met with Mr. Huxtable's statement a year ago he says he would not have credited it. But now he has found out that an allowance, *à la Anglicè*, of a small quantity of chopped straw and a little linseed-meal a great deal fewer turnips will be sufficient; nay, that the mixture will be more beneficial than the previous larger quantity of one kind of food only. On this point he proceeds, and makes many important admissions, and declares that he thinks this to be the most important fact brought out in the report presented to the club. Freely admitting, as he does this, as regards cattle, he demurs as to its applicability to sheep. The great outlay of cartage of the turnips, and the cartage again of the manure, would involve a state of things for which they were not prepared. The expense would be very great; and the present plan of folding he contended, and rightly contended we think, was in every respect superior to the shed feeding of sheep. Still, Mr. Morton, a Scotsman, located in England, a man of calculation and foresight and ability, practises it and finds it to answer. We leave the fact as we find it, but we will make no claim how far the superiority is real, nor would we even if the practice were general.

The subject of the quantity of manure applied to the land forms another source of the free criticism applied to the report, and this, it will be seen, arose out of the previous statement. If all the manure be made in the yards, as it will necessarily be, by carting to them the whole of the produce, it must be, that much more manure will be applied *as such* than there can be where folding or depasturation is adopted. Mr. Wilson not inaptly says that though the manure is only *carted* to the turnip crop, yet the great bulk of the turnip crop is consumed on the land, and this is a manure which applies to the remaining years of the rotation. The same truth will hold good as to the consumption of the second year's artificial grasses, but it is an important consideration, still unanswered, whether it is radically right to have any second crop of artificial grasses whatever, and whether they ought not to be ploughed up and turned to more account than they can be producing only 35s. per acre.

On the keep of farm horses Mr. Wilson takes two further objections to Mr. Milne's report. The first is, that he has overstated the cost of keeping a pair of horses; and the second, that the Scotch horses are made to do more work that the English. Mr. Milne stated the annual cost of a ploughman and pair of horses in Scotland to be £100. Deduct the wages of the ploughman, and the remainder was the cost of the team. To this Mr. Wilson demurs. He says there is also to be deducted harness, implements, wear and tear, and risk of loss. Now this may be so, still he does not give the exact cost of keeping the horses alone, but goes on to say that it would be much more economical to feed them on cut clover—to soil—than to depasture them in the ordinary way. And as regards the second particular referred to, it is easy to conceive how a Scottish farmer, consuming the vast bulk of his produce in the fields, can require so much horse labour as will be the case where the whole of it, or nearly so, is carted to the homestead.

Then comes the vexed question of quality of the soil. On this and on its rent Mr. Wilson makes a formidable attack. He compares Mr. Rigden's farm with a farm near Edinburgh, and claims for the Scotsman more credit than the Englishman. He puts Mr. Rigden, of near Brighton, on a par with Mr. Gibson's farm at Woolmet, as stated in the January number of *Blackwood,* and builds a long hypothesis on the parallelisms of the two cases.

He starts, however, with a fallacy. He says, "The Lothian farmer pays for his land 72s., while the Sussex tenant has his, *apparently of as good quality,* for 35s." He has done well to say "apparently." We answer how? There is nothing on the face of Mr. Milne's able report, or of *Blackwood,* to justify any such conclusion, and the most failing part of Mr. Wilson's reply to the report is the loose manner on which he talks about the soils. To show how illogical his conclusions are, we need only refer to his remarks on Mr. Huxtable's land. He says, "I would like to ask where, in all Scotland, can you get land at 15s. per acre, *capable, under any management,* of yielding from 30 to 36 bushels of wheat, or 25 tons of mangolds, per acre."

Why this is the very gist of the whole question. All land is bad from shallowness of soil or from the deficiency or excess of some ingredient. Here is a bad soil—so bad as hardly, in its then state, to be worth 15s. per acre. It is improved, it is made to grow its four quarters of wheat and its 25 tons of turnips. Why this is the essence of good farming. It is easy to make land naturally rich, grow anything. It will do it almost spontaneously; but it requires a clever man, a superior agriculturist, to make it triple its production. It has been done in England, and yet a Scotsman says it can be done by no sort of management. He must knock under to the English farmer then, and the sooner he admits it the better.

We will not add more. An estimate sufficiently accurate may be made of the status and deficiencies of Scottish farming, and they will do well to see about amends, rather than entertain jealous feelings.

The Berwickshire Farmer's Club, in their resolutions, admitted that the plans deserved a careful but cautious trial, that they approved of the remarks on the feeding of cattle, that the horse keep admitted of improvement, that they approved of Mr. Rigden's autumn manuring, but they could not approve of the shed-feeding of sheep, nor of the substitution of wattles for fencing.

We think that the thanks of Scotland are due to Mr. Milne, and his pamphlet will be productive of immense good to the community, notwithstanding Mr. Rigden has since said that he farms at a loss.

INFLUENCE OF EXTERNAL AGENTS IN DIFFERENT PLACES IN MODIFYING THE SAME SEEDS.—Differences in the soil, degrees of exposure, moisture, may affect a plant in different ways in the same climate. The Freneuse turnip is a remarkable example of this. This variety, characterized by a reddish tinge and peculiar taste, is constantly reproduced at Freneuse in a red soil; whilst efforts made in any other places to propagate it from seed collected at Freneuse have not succeeded; or, if they have, plants have been obtained, the seeds of which have either in the first, or at eall vents in the second or third generation, lost this property. There are, no doubt, places where it would grow exactly as it does at Freneuse. We see by this example why, in certain places where we wish to obtain individuals of certain species having any peculiarity not possessed by those plants which are yielded by seed gathered in the same locality, we are compelled to obtain fresh seed every year from those places where the seeds do yield plants with the desired properties. Thus we get from Brussels the seeds of a cabbage peculiar to that place regularly every year, and these seeds sown by us in our garden at Hay give us exactly what we want. Van Mons, when he removed his establishment from Brussels to Louvain, found the soil at the latter place less suitable for his fruit trees than that of the former; and that his cherries and peaches did not lose their qualities as much as his pears and apples. Again, the Besi de Quessoy is in Brittany a good pear, whilst at Paris it is good for nothing. The Bon chrétien d'hiver, though excellent at Paris, is uneatable at Gatinais.—M. CHEVREUL (from the French, in *Jour. Hort. Soc.*)

THE POOR RATE.

At a meeting of the Petworth, Midhurst, and Pulborough Farmers' Club, held at the Swan Inn, Petworth, on Tuesday the 18th March, 1851, at which many of the leading agriculturists in the neighbourhood were present; the Chairman, Mr. Sherwin, of Moor Farm, having announced that Mr. Albery, of Midhurst, would introduce the subject for discussion, viz., "The better assessment of the Poor Rate, and other matters connected therewith,"

Mr. **Albery** rose and said, Mr. Chairman and gentlemen, in bringing before you the subject for this evening's consideration, I must express my regret that a variety of causes should have prevented my devoting sufficient time to the task which I undertook, at a former meeting of this club to enable me to accomplish it so well as I hoped to have done. The subject of the poor laws is too extensive to be discussed in detail at one meeting, but I shall endeavour, by giving a general view of it, to direct your attention to some of the principal and most important points and questions with which, as farmers, it is desirable that you should be acquainted. In doing this I shall begin at the foundation, and show when, why, and how, the poor law was first introduced, and then trace, step by step, the alterations it has from time to time since undergone.

The poor rate, as a burthen or tax upon property, and also as to the number, variety, and importance of the objects to which it may be applied, may well be a subject for the consideration of those who are called upon to contribute so largely to it as the farmers of this country. It forms a considerable item in the expenditure of every farmer, and if we except perhaps tithes, the poor rate is generally the largest in amount, of all the taxes paid by the occupier of land. Notwithstanding its amount, the poor rate is not altogether an unpopular tax, and I attribute this to the controul which *may* be exercised over its expenditure by the persons from whom it is raised, and to the objects for which it provides. The primary purposea and object of the poor rate was strictly the maintenance of the poor; but to this, as I shall show presently, many other purposes have been added from time to time.

The origin of the poor rate is not altogether devoid of interest. When the disclosure of Christian truth introduced into this country corresponding principles, the duty of protecting the indigent against the extreme misery of their condition was considered a fit object for legislative provision, and the clergy and parishioners were commanded to take care that none should perish for want of sustenance.

From the earliest times, the maintenance of the poor appears to have been a "parochial concern" connected with the church, as is also, in fact, implied by the use of the word "parish," which signifies an ecclesiastical district; and for some time the church rate (which is undoubtedly the most ancient of the present local taxes), and the poor rate were the only parochial taxes. But it was when the encroaching avarice and grasping ambition of the Romish priesthood had placed a fourth part of the land in the kingdom within their grasp, that their monastic clergy, unmarried and free from the pressure of general demands, were able from their superabundant stores, and from the donations of individuals seeking the consolations of religion, to supply the poor with the necessaries of life. By this means they acquired influence, made a favourable display of virtue and benevolence, and silenced many clamours against their wealth, pride, ambition, and excesses. The Reformation depriving the indigent of this resource, introduced a new state of things, and cast upon the legislature new and complicated cares. Adequate means had to be provided for the support of the necessitous, and at the same time for the protection from invasion and encroachment of the general property of the realm.

Before the 27th Henry VIII., 1536, the relief of the poor was a legal charge, but undefined in amount, on the revenues of the secular clergy, aided by charitable foundations and the regular alms of monasteries and religious houses, collegiate churches, hospitals, and cathedrals; which were partly destined to this purpose by the specific bequests of successive generations of donors, testators, and benefactors, and partly afforded by the voluntary liberality of these bodies. The 27th Henry VIII., c. 25, was passed in the year after the suppression of the smaller monasteries, and in the same year in which the second and great visitation of these religious bodies took place. The course of legislation on this subject may be traced through the statutes from 27th Henry VIII., c. 25 (1536), to 43 Elizabeth, c. 2 (1601), as trying—first, the experiment of relying on the gifts of voluntary charity for the requisite funds; then that of enforcing individual contributions in cases of obstinate refusal; and lastly, that of raising the required supplies by means of a general compulsory tax, according to the method which still prevails.

The statute 27 Henry VIII. enjoined the head officers of cities, shires, towns and parishes, to keep the poor, and to set and keep to work valiant beggars, by way of voluntary and charitable alms. It required the head officers of corporate towns, and the churchwardens and two other annual officers of every parish, to collect these voluntary alms. Every preacher, parson, vicar and curate, as well in their sermons, collections, and bidding of beads, or warnings to pray on special occasions, as in the times of confession and making of wills, was to exhort, move, stir, and provoke people to be liberal for these purposes. By these means a new but voluntary fund was introduced to replace the revenue, of which the King's portion alone, by Bishop Burnet's calculation, amounted to about £1,600,000 a-year—a sum greatly exceeding twice the amount of the expenditure for the relief of the poor two centuries later, it being in 1748-9 and 50, on the average, £689,971 a-year, being little more than one-eighth of the expenditure for England alone in 1848-9, which was £5,479,509 9s.

The 5 and 6 Edward VI., c. 2, passed in 1551, seeks to stimulate the contributions to these voluntary alms. The collectors appointed under the statute are enjoined on the Sunday next, or next but one after Whitsunday, gently to ask every man and woman what they of their charity will give weekly towards the relief of the poor, to write the same in a book, and to distribute what they collect weekly to the poor and impotent. If any one able to further the charitable work obstinately and frowardly refused to give, or discouraged others, the minister and churchwardens were gently to exhort him; if he would not be so persuaded, the bishop was to send for him, and induce and persuade him by charitable ways and means, and so according to his discretion take order for the reformation thereof. All this accumulation of gentle persuasives, backed in last resort by the undefined discretion of the bishop for reformation of defective charity, failed to stir and provoke the people to contribute a sufficiency of voluntary alms.

The 5 Elizabeth, c. 3, 1563, gave the first authority for what may be strictly called a tax, but still only as an alternative to the voluntary alms, and as the very last resort against the obstinacy of recusants. It enacts, that if any person of his froward wilful mind shall obstinately refuse to give weekly to the relief of the poor according to his ability, the bishop shall bid him to appear at the next sessions, and at the said sessions the justices there shall charitably and gently persuade and move the said obstinate person to extend his charity towards the poor of the parish where he dwelleth, and if he will not be persuaded, the justices, with the churchwardens, may tax him according to their good discretion what sum he shall pay weekly towards the relief of the poor of the parish where he dwells. If he still refuse, the justices, on complaint of the churchwardens, are to commit the obstinate person to gaol until he pay the sum so taxed with the arrears. The 14 Elizabeth, c. 5, 1572, modifies but still continues this combination of the voluntary with compulsory contribution. It enables justices to settle such of the poor as the parishes do not provide for, in abiding places, fixed by the justices within their divisions. The justices are to apportion the relief and sustentation of these poor people, and that done, shall by their good discretion, tax, and assess all the inhabitants dwelling within their divisions, to such weekly charge as they and every of them shall weekly contribute. If any person obstinately refuse, he is to be brought before two justices to abide their order, or to be committed to gaol until he shall be contented with their order, and do perform the same. At length the 39 Elizabeth, c. 3., 1598, reverting to the *parish* as the district in which the poor were to be relieved, made the burden wholly compulsory, and established the tax for the relief of the poor in almost all respects as it was settled four years later, by the 43 Elizabeth, c. 2, which is the foundation stone of the poor rate as now existing. (5 *Hume*, 343.)

Such was the origin of the poor rate, and to enable us to form an opinion as to the policy of a measure of so much importance, and the wisdom of which has never been doubted, I shall quote the following paragraph from the appendix to the 5th volume of Hume's History of England, to show the state of the country at the period of which I have been speaking:—"It is worth remarking, that the advantage usually ascribed to absolute monarchy, a greater regularity of police, and a more strict execution of the laws, did not attend the former English government, though in many respects it fell under that denomination. A demonstration of this truth is contained in a judicious paper which is preserved by Strype (Annals, vol. iv., p. 290), and which was written by an eminent justice of peace of Somersetshire, in the year 1596, near the end of the queen's reign; when the authority of that princess may be supposed to be fully corroborated by time, and her maxims of government improved by long practice. This paper contains an account of the disorders which then prevailed in the county of Somerset. The author says that forty persons had there been executed in a year for robberies, thefts, and other felonies; thirty-five burnt in the hand; thirty-seven whipped; one hundred and eighty-three discharged. That those who were discharged were most wicked and desperate persons, who never could come to any good, because they would not work, and none would take them into service. That notwithstanding this great number of indictments, the fifth part of the felonies committed in the county were not brought to a trial, the greater number escaped censure, either from the superior cunning of the felons, the remissness of the magistrates, or the foolish lenity of the people. That the rapines committed by the infinite number of wicked, wandering, idle people, were intolerable to the poor countrymen, and obliged them to keep a perpeptual watch over the sheepfolds, their pastures, their woods, and their corn fields. That the other counties of England were in no better condition than Somersetshire, and many of them were even in a worse. That there were at least three or four hundred able-bodied vagabonds in every county, who lived by theft and rapine; and who sometimes met in troops to the number of sixty, and committed spoil on the inhabitants. That if all the felons of this kind were assembled, they would be able to give the greatest enemy her majesty has a *strong battle.* And that the magistrates themselves were intimidated from executing the laws upon them, and there were instances of justices of the peace who, after giving sentence against rogues, had interposed to stop the execution of their own sentence, on account of the danger which hung over them from the confederates of these felons. In the year 1601 there were great complaints made in parliament of the rapine of justices of peace; and a member said that this magistrate was an animal who for half-a-dozen of chickens would dispense with a dozen of penal statutes."

The basis of the imposition of the poor rate is a provision contained in the statute 43 Elizabeth, c. 2, s. 1, as explained and modified by numerous judicial decisions, and by some few recent enactments, as follows:—

"And they," that is, the churchwardens and overseers of the poor, "or the greater part of them, shall take order from time to time, by and with the consent of two justices of peace, to raise *weekly* or *otherwise* (by taxation of every inhabitant, parson, vicar, and other, and of every occupier of lands, houses, tithes unpropriate, propriations of tithes, coal mines, or saleable underwoods in the said parish, in such competent sum and sums of money as they shall think fit), a convenient stock of flax, hemp, wool, thread, iron, and other necessary wares, and stuff to set the poor on work; and also money for the relief of the lame, impotent, old, blind, and other, being poor and not able to work; and also for putting out of poor children apprentices, and to do all other things concerning the premises."

In addition to this primary purpose, the legislature has, however, from time to time, within the last century, taken advantage of the means provided by the poor rate for the attainment of various other objects; dealing with this important impost, in fact, rather as a general parish fund than as a special tax for the relief of the poor alone. The secondary charges upon the poor rate provide for upwards of 20 distinct purposes.

The following are some of the most recent and important:—

The expenses of constables, 18 George III, and 5 and 6 Vic.

The costs of making out, preparing, printing and collecting the jury lists, 6 George IV.

The expenses of emigration, in certain cases, 4 and 5 William IV.

The cost of books and forms for the registration of births, deaths, and marriages, and the fees to the registrars, 6 and 7 William IV.

The making a survey and valuation, 6 and 7 William IV.

The expenses of public vaccination, 3 and 4 Vic.

The discharge of outstanding parish debts, 5 and 6 Vic.

The expenses incurred by town clerks and returning officers of cities and boroughs, and by overseers of the poor in carrying into effect the act for the registration of voters, &c., 6 Vic.

The expenses incurred on the triennial perambulation of parochial boundaries, 7 and 8 Vic.

The expense of fencing, draining, and levelling lands allotted under the Commons' Inclosure Act, 8 and 9 Vic.

The expenses incurred in the removal of nuisances, 11 and 12 Vic.

The expenses of taking the census of the population, 1851, 13 and 14 Vic.*

Having shown the orign of the poor rate and the purposes to which it may be applied, I shall proceed to enumerate as briefly as possible the different kinds of property chargeable thereto, premising, however, that the general conditions of rateability confine the liability to property locally *situate within* the *parish, visible within* the *parish,* and productive of *private profit within the parish.*

1. Lands, whether occupied by the consumption of the body of the soil itself, as in the case of quarries, brick earth, gravel pits, and such like, by taking the renewable produce of the land, by mere use of land as a support or foundation for erections, or for standing places of persons, or commodities, by laying pipes, or in any other manner for profit or accommodation.

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* These expenses are, however, to be repaid by the Treasury.

2. Houses in occupation, with certain exceptions in favour of churches, meeting houses, and other buildings of a public nature.

3. Tithes impropriate and the rent-charges now payable in lieu thereof.

4. Appropriations of tithes, being tithes severed from a benefice and annexed to a spiritual corporation, and the rent-charges now payable in lieu thereof.

5. Coal mines, from the *express mention* of which in the statute it has been held that all other mines are excluded. This exclusion extends to lead mines; limestone mines, iron mines, and clay mines, but where minerals are taken from the surface of the earth, or by other excavations than "mines," they are rateable as a profit of "land."

6. Saleable underwoods, so defined in contradistinction to such as are to supply the land with estovers for fuel and the other purposes of the estate. The mention of underwoods has been held to exempt all other kinds of wood and timber.

7. Property constituting the "ability" of the parish, being the tithes of the parson or vicar, and the rent-charges in lieu thereof, and personal property or stock in trade.

Having taken a general view of the property liable to the poor rate, I proceed to consider some other matters connected with the poor rate, and I shall refer, for the purposes of the present discussion, to

1. The Highway Rate;
2. The Church Rate; and
3. The County Rate.

There are several other denominations of tax which may occasionally be the subject of local assessment, but I do not think it desirable to occupy your time by examining them in detail.

The county rate, though last in the above enumeration, I shall dispose of first, and that in a very few words, as the present contributions thereto are paid out of the poor rate, and are in effect contributed in the same proportion. The contribution to the county rate may therefore be now considered as one of the purposes of the poor rate. The county rate is in effect nothing less than a consolidation of about a dozen different rates formerly leviable throughout each of the 52 counties of England and Wales. But a few others still remain separately assessable, although the objects are invariably provided for out of the general county rate.

A great deal of agitation is now going on relative to the county rate, but it has not extended to this county, and for this very satisfactory reason, that the expenditure of no public fund is watched with such a scrupulous regard to economy, as is evinced by the justices of this county in the expenditure of the county rate.

With regard to the highway rate, the 5 and 6 William IV. puts it upon the basis of the poor rate, with a proviso that the same shall also extend to such woods, mines, and quarries of stone or other hereditaments as had theretofore been usually rated to the highways. This proviso was perhaps introduced upon the supposition that it had been the usage to assess to the highway rate certain woods, mines, quarries, and such like, which were not, as we have already seen, legally liable to the poor rate; and the usage in this respect differed in various parts of the country; so that in practice the highway rate differs very little from the poor with regard to the property liable to contribute to it. The highway rate is in some measure, if I may use the expression, payable in kind. The legislature, in order to secure to the farmers the team work which may be necessary for the repair of the roads within their respective parishes, very wisely provides that ratepayers keeping a team of two or more horses may divide among themselves the conveyance of materials for such repair.

The church rate was for many centuries the only parochial tax, and as many parts of the country were extra-parochial, that tax was of course levied somewhat less extensively as regards territory than the taxes imposed on townships; till it was very nearly universal throughout England. The rate is, as to its mode of imposition, founded on immemorial custom, and on this account its origin is incapable of being accurately described. Its payment could not be enforced by other than ecclesiastical authority until the 53 George III. It seems to have been fully established in the time of Lord Coke, that the church rate ought to be laid upon every occupier of lands within the parish; but it was also decided that a man could not be charged in the parish where he inhabited for land which he had in another parish. In the general scope of liability, founded on usage, with few exceptions, of no practical importance, it agrees with the poor rate. The owner of the glebe is exempt from this rate, being liable to the repair of the chancel, and there are a few other exemptions. This concludes the enumeration of the several kinds of rates proposed to be mentioned on the present occasion.

The rating of stock-in-trade I have reserved for a separate consideration. Stock-in-trade was not held to be rateable to the relief of the poor until a century and a-half after the passing of the 43rd of Elizabeth. Lord Mansfield, whose judgments on subjects of poor law were as admirable as those by which he acquired so great a reputation in other matters, resolutely controverted the liability, insisting strongly that it was impossible to carry the liability into effect, and that if it were possible it would be highly impolitic. The liability was, however, finally established a few years afterwards, Lord Kenyon, in the year 1795, treating it as a matter then beyond controversy.

It would be impossible, and if it were possible it would be intolerable, that neighbours filling the office of churchwardens, and overseers, and surveyors of the highways and other offices involving the duty of laying rates upon stock-in-trade, should make such searching inquisitions as would be requisite for the purpose of giving effect to a liability so complicated in its details and difficult of estimation as this. Accordingly, wherever the practice of rating stock-in-trade has prevailed, some arbitrary rule of assessment has been adopted. But the practice never did in fact prevail to any great extent. With few exceptions it was confined to the old clothing district in the west and south of England, and gained ground just as the stock of the wool staplers and clothiers increased to such an extent as to make the assessment an object with the farmers. Its adoption was followed by the granting of head money and other improvident practices, and produced conspicuous effects in deteriorating the habits and depreciating the wages of the agricultural labourer.

An attempt was once made to rate farmers for their stock, and the matter was referred by the Court of Kings' Bench to L. C. J. Holt, who held that it was liable; but the parties not being satisfied with his opinion, consented to submit the matter for the opinion of the judges, whereupon the following order was made:—"Upon mature deliberation it is considered by the court that a farmer is not taxable to the poor rate for his stock, and that a tradesman is taxable for his stock-in-trade;" and the reason was because the annual profits of the land being rated, the profits of the stock were already assessed in those of the land.

It was considered at the time of the passing of the Parochial Assessments Act, that stock-in-trade would be thereby impliedly exempt from the poor rate; but the Court of Queen's Bench having decided the contrary, an act was passed declaring that it should be so exempt, and that enactment has been continued yearly for some time past.

Looking at the difficulty of rating stock-in-trade, there is no doubt that its exemption will be continued: at the same time it must be admitted that great injustice is done to the occupiers of land; and if there should ever be an equitable adjustment of the taxes of this country, the fact that farmers are rated for the profits of their stock must be forcibly urged as one of the burdens to which they are peculiarly liable. It will be observed from what I have just said that the only ground upon which farmers were held not to be rateable separately for the profits of their stock was, that they were already rated for them in the calculation of the profits of the land. From which I draw this conclusion—that the farmer's stock is still taxed to the poor, although his profit is abolished by an unfair system of legislation, called by interested persons, to give it a popular name, free trade; but which I say is injustice, and not free trade. For my own part I should be very glad to see free trade in truth and in reality; but can we ever do so under the peculiar circumstances in which this country is placed? and can those circumstances be altered but by some terrible revolution, the consequences of which are too awful to contemplate?

Reverting again to the statute of Elizabeth, we may recall to mind that each person was to contribute according to his ability. Now, let us see how the present system operates in practice. Three years ago I knew two persons who then entered into business—one as a farmer, the other as a tradesman; each with a capital of about £500. At the present time, I believe, if the farmer was to relinquish his business, he would find his £500 very considerably diminished. It is an actual fact that the tradesman's income has been over £150 a-year. Now, what do you think these two individuals have paid for poor rates during the three years? The tradesman (of his ability), £12 6s.; the farmer (of his inability), £59 2s.; and this in one and the same parish. This example will show you how extremely unfair the present system of taxation operates if (according to the true principle of the statute of Elizabeth) ability is to be the criterion of contribution.

To return to the consideration of the assessment for the poor and other local rates, the result of the former observations will be that the only statutory description of property liable to the taxes I have mentioned, is that contained in the 43rd Elizabeth relating to the poor rate, and that the only tax imposed upon property according to the common law, or in other words, by custom and usage, is the church rate. In law, the liability to the poor rates, the highway rates, and the church rates, differs in many respects; but great as these legal differences may be, in general practice they are almost, if not altogether disregarded; and I believe I may affirm "that the whole of our local taxation is imposed either by law, or by usages regardless of the law, on the same basis as the poor rate."

We all know by practical experience that these rates are made and assessed separately by officers respectively appointed for that purpose, and that the value or rent of the property occupied has long been adopted as the proper criterion of the proportion to be contributed by each individual.

The rent being deemed the standard of value, no correction was needed in respect of tenants' taxes; they were paid by the occupier, and it was clear their amount would affect the value or rent to be paid to the landlord, so that the rent would still represent truly the actual value to the occupier.

But it was soon discovered that the rack rent did not truly represent in most cases the value of the property. In certain pastures no portion of that rent would be required to be consumed for repairs. In arable and dairy farms a considerable subtraction from the rent would be made, in the better classes of dwelling-honses still more, and in the lowest class of buildings a yet larger amount. Instead of attempting to adjust these deductions to each tenement, so as to give to each quality of land, and to each quality of buildings or other property, its appropriate share of advantage, the attempt was made, and was countenanced by the the courts in 1770, and from thenceforward, to fix an average for these deductions for all the property of a species; as for all land at three-fourths of the yearly value, and for all houses half of the yearly value, making no allowance whatever for the difference between one quality of land and another, or between one quality of houses and another. The result of this was, that in very few parishes was there adopted a proper system of rating: some were rated at rack rent, and others at four-fifths, three-fourths, two-thirds, one-third, and so on; and, although this may not have caused any very great amount of injustice to the individuals in a particular parish, as amongst themselves, yet, where they had to contribute to a rate on an aggregate district of parishes, according to their own assessment, as the county rate was formerly, it was evident that injustice could not be avoided.

The parochial assessments act was passed in 1837, and its object was to put an end to all such practices, and to establish one uniform system of rating throughout England and Wales; but the words used seem to have been so construed as to make confusion worse confounded, for although such is the expressed object, it remains a doubtful and disputed point up to this time, whether a rate can be successfully appealed against if it is not made on the net annual value, as defined by that statute. The act requires that "every rate shall be made upon an estimate of the net annual value, that is to say, of the rent at which the property might reasonably be expected to let from year to year, free from all usual tenant's rates and taxes, and tithe commutation rent-charge, if any, and deducting therefrom the probable annual cost of the repairs, insurance, and other expenses, if any, necessary to maintain them in a state to command such rent."

The defect in this statute which has been found most embarrassing in practice, arises from the awkward expression of the definition of "net rent." It seems not possible to doubt that by "net annual value" must be understood the value which remains after the tenant's taxes have been paid—such a rent, in fact, as a tenant would pay who bore the burden of a tenant's taxes, and, therefore, entirely opposed to such a rent as a tenant would pay who took the premises *free of* tenant's rates and taxes. Unfortunately the definition expresses the latter rather than the former rent. All this difficulty has been caused by the inconsiderate use of the words "free of;" whereas it is evident from the whole of the section, that the intention was, that the annual value should be calculated according to the rent at which they would let, *not free of*, but *subject to*, all usual tenant's taxes.

In practice, however, it has been found necessary to depart from the grammatical construction of this statute, and to adopt one consistent with what is considered to have been the *intention* of its framers, and accordingly the Poor Law Commissioners, in a circular letter addressed by them to the overseers of every parish in the month of June, 1837, distinguish gross rent and net rent as follows:—"Gross rent may be said to be that paid to a landlord who, himself, undertakes to pay all the usual tenants' rates and taxes, and tithe commutation rent-charge, repairs, insurance, and any other expenses necessary to maintain the premises in a state to command such gross rent. Net rent is the amount which is received by or remains clear in the hands of a landlord after all such taxes, charges, and expenses have been paid." They then recommend a mode of calculation for the purpose of ascertaining the net rent, and give an example. "Thus, suppose the tenant pays a rent of £76, and all the several tenants' rates and taxes, and the tithe commutation rent-charge, and the landlord only pays for repairs and insurance, you may state the matter thus:—

Yearly rent, tenant paying such rates and taxes, and tithe commutation rent charge........		£76
Deduct as paid by landlord.		
Average annual repairs	£3 0 0	
Insurance	1 0 0	
		£4
Estimated net annual value		£72"

If you will individually refer to the poor rates of your respective parishes, and compare them with the preceding statements, you will, I am sure, agree with me, that it is very far from right that so large an amount of taxation should be imposed in a manner so careless and improper, if not illegal.

Before pointing out what I conceive to be the most objectionable parts of the present system, and suggesting—as, with your indulgence, I propose to do—remedies for such of them as I know to be felt in practice, I shall call your attention to the agitation which has been going on for some time on two subjects; the first and most important being that which has found so much favour in one or two of the northern counties: I mean the system of which Mr. George Leny Hutchinson is generally acknowledged to be the founder, and which he has brought before the public by the compilation and publication of a book having the very comprehensive title of "A plan for the equalization of the poor rates throughout the united Kingdom, by abolishing the law of settlement and the removal of paupers, also, saving annually thousands of pounds to the ratepayers, preventing all parochial litigation, and greatly benefiting the condition of the poor."

This proposition of Mr. Hutchinson's, if carried into effect, would no doubt cure a great deal of abuse, and remedy a considerable amount of injustice; but it would also, I have no doubt, inflict injury and wrong in a variety of instances. For example, there are many parishes in which the ratepayers have done their duty, and by attention have reduced the rates and kept down pauperism; and why should the ratepayers of such parishes be deprived of the benefits accruing to them in return for their diligence, and, it may be, their judicious application of a large expenditure in past years?

The other proposition is much milder, and it seems to me much more feasible, but I am inclined to doubt if it be so just. It is that of a committee called "The City of London Rating Association," which proposes union settlement and union rating.

The former proposition does not meet with much support, and I rather think the agitation is declining for want of funds. The latter has been before parliament, and I should not be surprised to see it adopted.

It is not my intention on the present occasion to provoke a discussion on either of the above plans, and I shall now proceed to consider some of those practical objections to the present system which I have already adverted to.

In the first place I think all the anomalous distinctions between the poor rate, the highway rate, and the church rate, should be abolished, and instead of having these rates separately assessed and collected, I recommend their consolidation into one rate. This would save an immense amount of trouble and inconvenience. One or more officers should be appointed in each parish, who should have no other duty to perform than the assessment and collection of the parochial consolidated rate. Of course this rate would be applicable not only to the purposes of the present poor rate, but also of the highway rate and the church rate, and would in the aggregate represent the amount of the three rates. To this proposition it will be no doubt objected that the increased amount to be thus collected in one rate will render it more difficult of collection. I admit that it would be so if another important improvement which I recommended should not be adopted, because every person who has the misfortune to become a tax gatherer is well aware, as regards many ratepayers, that if £4 is to be collected, it is very often, and generally, much easier obtained in four payments of 20s. than in one sum. We have already seen the poor rate is directed to be made *weekly or otherwise*. This, when each ratepayer was personally known to the churchwardens and overseers, when the amount was small, and was collected at the church doors after service on Sundays, may have been convenient; but when it became necessary to make books, and the increase of the rate made the accuracy of assessment a matter of importance, and frequently of controversy, weekly rates became inconvenient, and the overseers availing themselves of the words "*or otherwise*," began to make rates for longer periods. In the reign of Queen Anne, 1705, the courts maintained that there ought to be a *monthly* rate; but that it could not be assessed for the whole *quarter* of a year. In the first year of the reign of George III., 1761, we have Mr. Justice Wilmot's authority that whatever the *law* might be, the practice then was *not* to make rates *monthly*, and in 1771 it was held no longer necessary to make the rate *monthly*, and a *quarterly* rate was supported. In 1797 a rate made for *six months* was held to be good, and reasons were assigned for the decision which would equally support a rate made for *twelve months*. In practice the period for which the poor rate is made, varies much in different districts and in different parishes. It is usual to make a rate previous to the 25th March, in order fully to cover any claims then existing against the overseers who are about to go out of office. In town parishes the usual practice is to make the rate quarterly. The most convenient practice is, however, that authorised by many local acts, of making one rate estimated for the expenditure of a *whole year*, but divisible, for collection, into *quarterly* portions: this is the course which I think may well be adopted. The burden would be thrown over the whole year, it would be much easier of collection, and would prevent frequent disputes as to the proportions of outgoing and incoming tenants. But, for whatever period a rate may be made, it will happen that some of the persons liable remove, and cease to occupy before that period is expired, and become liable to the like rate in some other place. It may also occur that a person may begin to occupy some rateable property during the currency of the rate; or it may occur that a property may become rateable for the first time during the currency of a rate, in either of which cases, unless the person or the property can be subjected to the rate, there will be an evasion of the common burden; I therefore add to my last recommendation, that any person occupying during any portion of a quarter should be liable for that quarter's portion of the rates.

My next proposition is, that the assessment (in every parish) should be upon the net annual value, according to the provisions of the parochial assessment, not as construed grammatically, but as adopted in practice. These provisions have already been considered.

Although in many parishes, since the passing of the Parochial Assessments Act, new valuations have been made, I very much doubt whether matters are at all improved. The basis of the valuation varies as much as ever it did—we still have the old assessments at four-fifths and other odd proportions. A vast amount of money has been expended in surveys and valuations to no purpose whatever, if we except increased dissatisfaction, and, as I shall show presently, increased and increasing injustice. The great difficulty which is always found in the parochial assessment is the utter impossibility of correcting a rate with respect to one person without making it incorrect as regards another. Whenever a proposal is made to reduce the assessment of one person, it is sure to be met by the observation from many, if not all, other ratepayers, "If you reduce him, you must reduce me: I'm quite as high as he is; take him off so much, and me off so much, and then it will do;" and so the unlucky overseers may go on, until they have altered every rating in the parish, and then find themselves and the rate just as they were, the rate as incorrect as ever, and the several rate-payers just as dissatisfied as before the attempted amendment commenced. If the net annual value (which may be ascertained), was, however, the compulsory basis, there would be some criterion which might, to a certain extent, be acted upon, and which would in some measure guide parties in coming to a conclusion as to the rateable value. The old principle of the poor rate, the "weekly or otherwise," of the statute of Elizabeth should be adhered to, and the valuation instead of being a separate and occasional process, should be involved in and be identical with the making of the rate. It is an essential objection to the plan of making the valuation a separate and occasional process, that the valuer comes to the district more or less wanting in experience of the place and the properties to be valued; that during the process of valuation, and before it is acted on as a basis for taxation, its defects cannot be known, or will not be tested; that when he has completed his task, the valuation is placed in the hands of those who have to use it as the basis of assessment, but who, not having made the valuation, must be unacquainted with the valuer's reason, cannot, if they should be willing, either make effectual application of his data, or effectual defence when his estimates are impugned, and who, moreover, when they themselves for any reason entertain objections to his conclusions, have his valuation at their mercy when his functions are at an end. It is therefore desirable that there should be a permanent security for the constant adaptation of the valuation to the changing circumstances of property; but it appears incompatible with the object of obtaining a fair valuation that the process should be continued as the functions of one or more of the ratepayers, or any officer like an assistant overseer, interested in conciliating his own parish, or interested in serving one class of ratepayers to the prejudice of another.

The result of this, as it seems to me, is that a proper and efficient person totally disinterested should be appointed by some non-parochial authority for a combination of parishes, and that such officer should be referred to on all occasions of changes, diminution, or increase of value; in fact, in all the various circumstances which may from time to time render an adjustment of the valuation necessary; and that it should be his peculiar province to adapt the valuation to all changes, and to revise it so far as may be necessary previous to the making of each rate. This officer should be a permanent paid officer, and this part of the proposition will, no doubt, make the whole objectionable. But, I think the expense would be more, much more, than counterbalanced by the amount of injustice and error which it would prevent, and by the expense it would save in accurate assessments, periodical valuations, and expensive appeals.

If the valuation for the poor rate was a continuing process, if the valuer's attention was called periodically, on the making of a rate, to any altered circumstances in the value of property, and if the valuer discharged his duties faithfully, I think a great deal of injustice and unfair assessment would be prevented. If we look around us at the present time, where can we see the justice of assessing farmers at the sums set down in the valuations of five, ten, or fifteen years ago? In truth and in fairness, those valuations are much worse than worthless—they are a constant and continuing wrong. It may be said that all other kinds of property have diminished in value in proportion, but I do not think so. The system of free trade, so called, has benefited some classes at the expense of others; and it is those properties, the occupiers of which are so benefited, that ought to bear an increased burden, proportioned to the advantages which they now enjoy, always bearing in mind the principle enunciated in the statute of Elizabeth, that "ability" must constitute the basis of each individual's share of the common burden.

On the subject of appeals against rates, I now wish to say a few words, because it may with some appearance of truth be urged in answer to my statement as to the general inaccuracy of the present parochial assessment, that the absence of appeals denotes that the present system is not so faulty as I would have you to believe. But there are several reasons why the power of appeal against rates is not more extensively adopted as the means of redress against an unfair assessment.

1st.—There is a prejudice against appellants. An appellant is generally set down as a litigious discontented individual, unwilling to contribute his fair quota of a tax.

2nd.—It frequently causes an amount of ill-feeling and controversy sufficient to disturb the harmony of a parish for years.

3rd.—The tribunal now resorted to is not adapted for the determination of appeals. The two Justices sitting in Petty Sessions, to whom the appeal is made, do not inspect the property, nor is it to be expected they should do so, and perhaps even if they did, the matter would not be mended. But they are not expected to inquire, and certainly they do not do so, what is the condition of the property; they hear nothing of the facts: they merely hear the inference of one man or more, that the value set down is correct; and they hear the inference or opinion of another man, or of other men, on the other side, that it is not correct: and, as it very frequently happens that the weightiest purse produces the weightiest evidence or opinion, it does not always happen that justice is done; not that the justices are to blame, for all they have to do is to decide "according to the evidence," and the evidence is merely the opinions of the valuers *pro* and *con*. I think the valuer who makes the valuation should be made personally and permanently responsible for the accuracy of the rate made upon it; that if his assessment should be objected to, he should be at liberty to amend the rate, and if he resolved to defend it, then that he or some person nominated on one side, and any professed valuer who might impugn the valuation on the other side, with some professional person as umpire, should decide the question; their award, to be made on an actual inspection of the property, by a majority of opinions, to be final. The costs of this should be limited to a reasonable and fixed sum, and the payment should be so regulated as to make it to the interest of the valuer to adjust the rate upon application in the first instance, and not to provoke even an alteration. These awards should only be extended to questions of value, and not of liability.

I have already stated that mines in general are exempt from poor's rate. Whatever may have been the original reason for this exemption, it is no longer a just one, and therefore ought to be abolished. We are, however, in this district more interested in the question of timber and tall trees, which are also, as before observed, exempt from the poor rate. One of the reasons for this exemption was, that the poor's rate was understood and intended to be an occupier's tax and not a landlord's tax, and tall woods were generally retained by the landlord. But the very foundation of the exemption must be considered untenable, for is not the poor tax in every case a tax upon the landlord? Most certainly it is; for what is the difference whether it be paid by the landlord or tenant? it must ultimately fall upon the property; if not paid by the landlord, in a diminution of the rent received from the occupier.

The exemption of timber is a benefit to every landlord who has more on his estate than his neighbours in the same parish, and when we consider the benefit which the owner of timber derives from the highways alone, it is surely fair that he should contribute towards, and not be exempt from their necessary repair. I very much doubt whether the conveyance from place to place of any kind of produce is so injurious to the highways in this immediate neighbourhood as timber, and yet it is not when growing legally liable to bear any part in their repair. Some persons will contend, however, that it is policy to encourage the growth of timber in this country, the legislature has, it seems, recently thought otherwise; but whatever may be the merits of the question between the timber of this country and timber imported as regards the products of this country, whatever has a tendency to encourage one kind of produce must to the same extent artificially discourage another. Besides this, the exemption of timber in practice frequently enables the owners of properties not strictly timber to escape the tax. A remarkable instance of this is the case of Rex *v*. The inhabitants of Ferrybridge, 1 B. & C., 375, in which case it was decided that where the occupier of 650 acres of land in Ferrybridge (for the whole of which he was rated to the poor) planted 340 acres of it with oak and ash trees for timber, and closely intermixed them with Scotch firs and larches for the purpose of sheltering them: according as the oak and ash trees grew up and required more room he cut down the firs and larches, some of which he employed in building, others he sold at a profit. Being rated in respect of these firs and larches, as being saleable underwood, he appealed: and the court held that he was not rateable for them; they said that the statute extends only to such underwood as is intended to be sold, and is planted with that intention; here the firs and larches, if underwood at all (and that was very doubtful), were planted, not principally, or perhaps at all, for the purpose of sale, but to afford shelter to the oak and ash trees, and were cut down, not with reference to their size or age, but whenever it was required for the benefit of the oak and ash trees, whether underwood or not, at all events they were not saleable underwood, and therefore not rateable.

My remarks on this subject have now extended to a greater length than I fear the interest they have created may warrant, and I therefore conclude, Mr. Chairman and gentlemen, with thanking you for the kindness and patience with which you have listened to me.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Weekly Council was held at the Society's House, in Hanover-square, on Wednesday, the 26th of March. Present: Mr. Raymond Barker, Vice-President, in the chair; Lord Lovaine; Sir Robert Price, Bart., M.P.; Mr. H. Barnett; Mr. Burke; Mr. W. G. Cavendish, M.P.; Mr. Fuller, M.P.; Mr. Gadesden; Mr. Fisher Hobbs; Mr. Maddison; Mr. C. E. Overman; Mr. Parkins, Mr. Pickin, Mr. Rowlandson, Professor Sewell, Mr. Shelley, Mr. H. A. Smith, and Professor Way.

Communications were received from the Marquis of Downshire, the Mayor of Manchester, Mr. Hill Dickson, and Mr. Donlan.

Mr. Key, of Newgate-street, who recently submitted to the inspection of the Council a Gutta Percha Pump for Liquid Manure, had leave to show to the members, at this meeting, the operation of his new turnip-cutter, by means of a neat working model constructed for the occasion.

Professor Way kindly consented to deliver a Lecture before the Members, in the Council Room of the Society, on Wednesday, the 14th of May, at 12 o'clock, "On the Agricultural Employment of Common Salt."

The Council then adjourned to their monthly meeting on Wednesday, the 2nd of April.

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A Monthly Council was held at the Society's House in Hanover Square, on Wednesday, the 2nd of April. Present, His Grace the Duke of Richmond, K.G., President, in the Chair; Marquis of Downshire, Lord Camoys, Lord Berners, Lord Southampton, Lord Braybrooke, Lord Bridport, Lord Ashburton, Hon. R. H. Clive, M.P., Sir Thos. Dyke Acland, Bart., M.P., Sir Robert Price, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Sir Montague Cholmeley, Bart., M.P., Colonel Austen, Mr. Raymond Barker, Mr. C. Barnett, Mr. Beasley, Mr. G. Bennett, Mr. Bramston, M.P., Mr. Brandreth, Mr. Burke, Mr. W. G. Cavendish, M.P., Colonel Challoner, Mr. Evelyn Denison, M.P., Mr. S. Druce, Mr. Foley, M.P., Mr. Garrett, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hudson (Castleacre), Mr. Jonas, Mr. Kinder, Mr. Lawes, Mr. Milward, Mr. Pusey, M.P., Mr. Sanford, Prof. Sewell, Mr. Shaw (London), Mr. Shaw (Northampton), Mr. Shelley, Mr. Sillifant, Prof. Simonds, Mr. Simpson, Mr. Slaney, M.P., Mr. Stansfield, M.P., Mr. Thompson, Mr. Turner (Barton), Mr. C. Hampden Turner, Prof. Way, Mr. Jonas Webb, and Mr. Wilson.

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, laid before the Council the Report of the accounts of the Society to the end of the previous month, from which it appeared that the current cash-balance in the hands of the Bankers was £2,038 (including £819 on account of life-compositions).

Chemical Investigations.—Mr. Pusey, M.P., Chairman of the Chemical Committee, laid before the Council the following Report, which was received and adopted:

REPORT.

Your Committee have to report, that since April, 1850, about 120 Analyses have been executed, at the request of Members, at the laboratory. Though this number is not unsatisfactory, they observe with regret that, of these, only 20 have been analyses of guano. In the hope that Members may avail themselves more largely of this only security against the heavy loss arising from adulteration, the Committee recommend that Mr. Way's spontaneous offer of reducing the charge for a partial analysis of guano from 7s. 6d. to 5s., and for a complete analysis from 20s. to 10s., be accepted; and they recommend to Members of the Society the adoption of this easy defence against fraud. Of the subjects adopted for inquiry last year, "The absorptive properties of Soils" has been carried on, and the results have appeared in a Lecture delivered by Mr. Way and in the Journal. The Committee recommend that this novel and interesting subject be pursued further, with reference especially to time and to the mode in which ammonia is set free again in soils, for the support of vegetation; on which branch of the inquiry, Mr. Way is prepared to deliver a lecture before the Society. The analysis of marls has been completed, and the Committee recommend as a new subject, "The Torrefaction of Soils," that is to say, the causes of the manuring properties of Burnt Clay in certain districts; and they hope that Members residing in such districts will send immediately to the Secretary specimens of such fertilising clays, in the raw and the burnt state. It would be also very desirable that specimens of clays, which have been found to fail as manure after burning, should be forwarded. The examination of the nutritive properties of grasses has been carried on to a considerable extent, and it appears to the Committee desirable that it should be continued in the ensuing year, with a view to a complete examination of the subject. (Signed)

April 1, 1851. PHILIP PUSEY, Chairman.

Country Meeting of 1851.—The Council were favoured by the attendance of Deputations from Kingston-on-Thames and Windsor, who kindly explained to the Council the advantages respectively possessed by Bushy Park and the Windsor Home Park, as sites for the Society's Country Meeting, to be held in July next. The noble

President having thanked these Deputations for their personal attendance, the information they had communicated, and the various plans and other documents they had laid before them, they retired from the Council Room, when the Marquis of Downshire brought forward, and Sir Robert Price, Bart., M.P., seconded, the motion of which his Lordship had given notice—that the Home Park at Windsor should be the place of the Country Meeting, instead of Bushy Park, as previously intended. The whole subject received from the Council the maturest consideration, and a full discussion of the various points and bearings of the question, when, on the motion of Mr. Shaw, of London, seconded by Mr. Hamond, it was carried that the President should be desired to direct a Special Council to be summoned for the purpose of receiving their report, and rescinding the resolution of the Council by which Bushy Park was decided upon as the locality of meeting, with a view to the substitution of the Home Park of Windsor in its place. The President at once acceded to this request, and directed such a Special Council to be summoned for Wednesday, the 16th inst. It was also carried, on the motion of Sir Thomas Acland, Bart., M.P., seconded by the Hon. R. H. Clive, M.P., that the same inspection that visited Bushy Park should be requested to visit the proposed sites and localities at Windsor, offered to the Society by the gracious permission of Her Majesty and Prince Albert, and to report the result of their inspection to the Special Council on the 16th inst.

Country Meeting of 1852.— Memorials, and the requisite plans of sites connected with the Country Meeting of the Society, were laid before the Council from the authorities of Lewes and Maidstone, in reference to the Country Meeting of 1852, to be held in the South-Eastern District, comprising the counties of Kent, Surrey, and Sussex. Mr. Raymond Barker, Mr. Brandreth, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Jonas, Mr. Milward, and Mr. Shaw, were appointed as an Inspection Committee to visit these localities, and to report their respective accommodation and advantages to the Council on the 7th of May, when the decision of the place of meeting will be made.

Steward of Cattle-Yard.—On the motion of Mr. Brandreth, Mr. Milward was appointed a Steward of the Cattle-yard at the Country Meetings of the Society, in the place of Mr. Hudson, of Castleacre, who retires this year by rotation.

Communications were received from a Public Meeting at Slough, the Royal Bucks Agricultural Society, and the Great Western, the South-Western, and the South-Eastern Railway companies, as well as from various parties, making enquiries on points connected with the ensuing Country Meeting of the Society.

The Council then adjourned to the 9th April.

A Weekly Council was held at the Society's House in Hanover Square, on Wednesday, the 9th of April: present, the Earl of Ducie, Vice-President, in the chair, Lord Bridfort, Sir Robert Price, Bart., M.P., Sir John O. B. Johnstone, Bart., M P., Don Domingo Savignon, Mr. Hodgson Barrow, M.P., Mr. Bosanquet, Mr. Burke, Mr. T. T. Clarke, Mr. Capel Cure, Mr. Dyer, Mr. Godesden, Colonel Hall, M P., Mr. R. Jennings, Mr. Maddison, Mr. Marshall, M.P., Mr. C. E. Overman, Mr. Parkins, Mr. Rowlandson, Mr. Sanford, Mr. Serjeantson, Prof. Sewell, Mr. H. A. Smith, Mr. Robert Smith, Mr. S. R. Solly, Mr. C. Hampden Turner, Prof. Way, and Mr. George Wilbraham.

Communications were received by the Council, from Viscount Palmerston (through Mr. Addington) transmitting a copy of a work from Vienna, "containing an account of an insect called the Gollubatz-fly, which has been very destructive to Cattle on the Lower Danube;" from Chev. Claussen, copies of a pamphlet published by him on the flax question, and an expression of his thanks for the kindness with which the Council had received him at two of their weekly meetings; from Mr. Wheble, of Bullmershe Court, near Reading, reporting favourably of Mr. Donlan's machinery, which he had inspected, for the preliminary operations of the farmer on the flax grown by him, and rendering it at once, in his opinion, adapted for M. Claussen's purposes, without much trouble or expense—Mr. Wheble also transmitted specimens of flax prepared in his presence by Mr. Donlan, in the course of five minutes, and he expressed his opinion, that with this mechanical facility offered to them, many farmers would grow flax, which he thought neither an expensive nor an exhausting crop; from Mr. Bethell, of 8, Parliament Street, samples of fibre from Rye-grass, which the spinners at Manchester stated they could easily work into fine cloths; from Sign. Londriani, of Milan, offering to instruct the dairy-farmers of England in the method of making from skimmed milk, a cheese equal to the "Parmesan" cheese of Lombardy, possessing the same qualities for keeping which rendered that cheese so well adapted for provision purposes in the Navy; from Mr. M. C. Salvin, a copy of a Farming Essay on the Management of Clay-land under green crop; from Mr. C. Whytell, results of his experience in the use of manures and the destruction of Wire-worm.

The Council having ordered their thanks for the favour of these communications, interesting discussions ensued among the members present, on the destruction of the wire-worm and on the action of charcoal in depurating fecal matter. Colonel Hall, M.P., reported the great advantage he had derived from a Drill Roller or Presser, supplied to him by Messrs. Barrett and Co., of Reading. It was particularly adapted for light lands, and was well known and estimated in the East Riding of Yorkshire. It was drawn by four horses, the pressers were about 3 or 4 inches apart, and they cut about half an inch deep into the soil. When the turnips were about 6 inches out of the ground he passed this roller over them, and in every case of his own trial, or that of others he had heard of, the wire-worm was entirely destroyed. On coleseed, or barley, it had the same effect. He considered that it consolidated the land more than Crosskill's Clod-crusher. Sir John Johnstone called the attention of Prof. Way to the action of charcoal as a deodoriser and secerner of manuring matter. Prof. Way related some interesting researches in which he had been engaged on this subject. He had found that although charcoal in fine powder when used as a filter would intercept all manuring matter held in mechanical suspension, and would transmit the water through it perfectly clear and colourless, as it had not the power to arrest the valuable element ammonia and other soluble matter, which passed through along with the water: also that the manuring matter which it did arrest was only brought by the charcoal into a condition to become more rapidly decomposed and to escape in the gaseous form into the atmosphere; so that the charcoal was of comparatively very little greater value as a manuring substance from the circumstance of its having been employed as the bed of the filter. Prof. Way then proceeded to answer the various enquiries made of him on points connected with this important subject, and received the thanks of the Council for the interesting details he had given them. Sir Robert Price, Sir John Johnstone, Mr. Marshall, Mr. Robert Smith, Mr. Rowlandson, Mr. Sanford, and other members present, also furnished interesting practical details on this subject.

The Council then adjourned to Wednesday, April 24.

A Weekly Council was held at the Society's House in Hanover-square on Wednesday, the 16th of April; present, Mr. Raymond Barker, Vice-President, in the chair; Lord Berners, Sir Robert Price, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Don Domingo Savignon, Mr. Burke, Col. Challoner, Mr. Clarke, Mr. C. Cure, Mr. Dyer, Mr. Gadesden, Mr. Brandreth Gibbs, Col. Hall, M.P., Mr. Fisher Hobbs, Mr. Kinder, Mr. W. Long, Mr. Parkins, Mr. Pocock, Mr. Rowlandson, Prof. Sewell, Mr. Sheridan, M.P., Mr. R. Thompson, Prof. Way, and Mr. G. Wood.

Communications were received from Mr. Lister Maw, on the desirableness of establishing principles on which judgment is given in the award of prizes to breeding stock at the country meetings of the Society; and from Col. Hall, M.P., correcting a misapprehension of his meaning at the last Council, in reference to the height of the turnip plant, when he employed the press-roller, and the exact address of the firm who supplied him with that implement: "The turnips were from 2 to 3 inches in height, instead of 6 inches, when the press-roller was applied for the destruction of the wire-worm; and the makers of the implement were Barrett and Ashton, of Hull, instead of Barrett and Co., of Reading."

Among the presents made to the Society, were the Bombay Magnetical and Meteorological observations for 1846-7, from the East India Company; series of reports on Flax cultivation and management, by the Royal Flax Society at Belfast; Treatise on the Cultivation and Management of Flax, with instructions in the various Belgian methods of growing and preparing it for market, from Mr. E. F. Deman; Lecture on the Blights of the British Farm, arising from Parasitic Fungi, from Dr. Plomley, of Maidstone; and a Treatise on Land Drainage, Embankment, and Irrigation, from Mr. Donald, C. E.

Thanks having been ordered for these communications and presents, an interesting discussion ensued on the mode of treating the fibre of Rye-grass and Flax for the manufacturer; in the course of which Mr. Rowlandson, Lord Berners, Colonel Challoner, Mr. Parkins, Sir Robert Price, and Professor Way furnished valuable hints, suggestions, and results of personal experience.

A Special Council was held on the same day, The Earl of Ducie, Vice-President, in the chair. The following members of the Council and Governors were present:—Lord Berners, Sir Matthew White Ridley, Bart., Sir Robert Price, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Mr. Raymond Barker, Mr. Burke, Colonel Challoner, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Kinder, Professor Sewell, Mr. Shelley, Mr. Sheridan, M.P., and Professor Way.

The Marquis of Downshire, Colonel Challoner, Mr. Fisher Hobbs, Mr. Brandreth Gibbs, Mr. Raymond Barker, Mr. Jonas, and Mr. Shaw, accompanied by Mr. Hudson, the Secretary of the Society, having visited Windsor on Monday last, for the purpose of inspecting the sites for the Country Meeting, Colonel Challoner presented the following Report of that Committee, which was read and adopted.

"The Inspection Committee, in pursuance of the instructions of the Council, at their last monthly meeting, proceeded on Monday, the 14th instant, to visit the site in Windsor Park, so graciously placed at the disposal of the Society by Her Majesty, for the purposes of its country meeting to be held this year in the month of July. The Committee made a careful survey of the site proposed for the show-yard and pavilion; and having received from the gentlemen by whom they were accompanied every reply to their enquiries, they took into their mature deliberation and discussion the several points on which they had been called upon by the Council to make their report, and finally agreed unanimously to the following recommendations:—

"I. That the site proposed by the authorities of Windsor is in every respect most eligible for the purposes of the country meeting; being a firm level mead, on a dry gravelly soil, 19 acres in extent, lying immediately beneath the slopes and terraces of Windsor Castle, and nearly contiguous to the railway stations and the public road leading from the Home Park into the town.

"II. That on this site a show-yard should be erected, covering an area of 10 acres; capable, however, from the usual mode of its construction, of being enlarged or contracted in its dimensions, to the size actually required, at the time of the meeting, for the accommodation of such a number of animals as may be entered for competition by the 17th of May, the latest day for receiving certificates. The Committee are of opinion that it will be desirable to have the show-yard so constructed that its intersecting lines may be either parallel with, or at right angles to the north front of the castle, all the exhibition-sheds being placed at right angles to it, and their middle avenue in a direct line with its centre: an arrangement by which both the symmetry and perspective of the whole will be preserved; and they recommend that Mr. Brandreth Gibbs should be requested to favour the Society with his plan of the yard, as usual.

"III. That the pavilion for the great dinner of the Society should be erected in the Home-park, on a site further removed to the north, between the show-yard and the line of railway; and that Mr. Manning be desired to prepare the requisite plan for it, embodying the suggestions of Mr. Shaw, one of the stewards of that department, as well as the suggestions of other members of the Committee, in reference to the convenient adaptation of the building to the special purposes of the meeting.

"IV. That the Guildhall and other official rooms kindly placed at the disposal of the Society by the authorities of Windsor, appear to the Committee to be well adapted for the purposes for which they have been severally offered."

The Council then rescinded their resolution of the 20th of February last, by which they had arranged with the Commissioners of Woods and Forests to hold the Country Meeting of this year in Bushy Park, and substituted the Windsor Home Park in its place, the Secretary being authorised to communicate this decision to the Mayor of Windsor, and to inform him that it was made under the usual condition, that by that day week the requisite memorandum of agreement should be entered into by him, on the part of the authorities of Windsor, with the Secretary, on the part of the Society, under the seals of their respective corporate bodies.

The meetings of the Council stand adjourned over Easter-week, to Wednesday, the 30th of April.

NEW MEMBERS.

Brett, J., Corpe Lodge, Wimborne, Dorset
Brooks, Samuel, the Bank, Manchester
Burbury, John Jackson, Ibstock Grange, Leicestershire
Caines, James, Cheselboyne, Blandford, Dorset
Cartwright, William S., Stow House, Newport, Monm.
Cumming, Lachlan, Munfield, by Inverness
Donovan, Alexander, Framfield, Uckfield, Sussex
Esdaile, Wm. C. Drake, 10 Gloucester Square, London
Francklin, John (High-Sheriff, Notts.), Gonalston, Nottingham
Gaskell, Charles Thomas, Fulmer House, Gerrard's Cross Bucks
Hatchard, Rev. John Alton, Lee Priory, Wingham, Kent
Hayward, Henry Scott, Folkington, Willingdon, Sussex
Honeywood, William, Chilton Lodge, Hungerford, Berks
Jones, Edward, Bridgewater, Somerset
Robinson, Thomas, Burton-on-Trent, Staffordshire
Lloyd, T. D., Bromwydd, Carmarthen
Lobb, George, Lowhitton, Launceston, Cornwall
Locke, Wadham, Stourcliffe, Christchurch, Hants.
Methley, Willoughby, Hoath-court, Blean, Canterbury
Montgomerie, Fred. Molyneux, Garboldisham, Norfolk
Mordey, John G., Sunderland, Durham
Musgrave, Christopher, Claverdon, Warwick
Nicholetts, John Toller, South Petherton, Somerset
Nurcombe, John, Hopcott, Minehead, Somerset.
Parrott, Geo. Lewis, Parsonage, Aveley, Romford, Essex.
Pollok, Allan, jun., Broom, Glasgow
Smythe, Frederick, Tenby, Pembrokeshire
Tottenham, Rev. Rt. Lofters, Vicardale, Carrickmacross, Ir.
Turner, C. T., Staplegrove, Taunton, Somerset
Walker, George Richard, Heathfield House, Oxford
Whitford, C., St. Columb, Cornwall
Wilbraham, Hugh, Westport, Co. Mayo, Ireland.

THE AGRICULTURAL DISTRICTS OF ENGLAND.

FROM THE TIMES' COMMISSIONERS.

BOSTON, LINCOLNSHIRE.

We propose dedicating this letter to a description of that immense district of fen country which extends from the estuary of the Wash into the six counties of Cambridge, Lincoln, Huntingdon, Northampton, Suffolk, and Norfolk. The space thus covered is calculated to be upwards of 680,000 acres, and the whole forms a level continuous plain about 70 miles in length and from 20 to 40 in breadth. From the high grounds which surround this vast expanse of country six large rivers descend into it—viz., the Ouse, the Nene, the Cam, the Witham, and the Welland. These in their course to the sea move along the level of the fens so slowly that the whole district would without proper precaution become flooded by them. Accordingly great works have been formed, and an immense expense incurred in confining the waters within appointed channels, and causing them to find their way to the ocean without injury to the land through which they pass. In remote times the whole district now comprised within the great level of the fens appears to have been a vast bay of the sea, studded with islands. To this probably succeeded a period, when during one-half of the year the waters subsided, leaving an immense tract of boggy wilderness. Human industry persevered, and at length the encroachments of the ocean were placed within bounds. Over the soft surface of that vast alluvial deposit which filled the basin of the fens vegetable life became developed, and shot up with rank luxuriance. Man still persevered. The Romans built banks for repelling the sea, and opened drains for carrying off the stagnant waters. On spots slightly raised above the level of the plains the monks erected many abbeys, adorning and cultivating the land around them to the utmost of their power. Then came a new era in the history of the fens. Within these wastes the turbulent and marauding spirits of a stormy age found shelter, and thither they flocked in great numbers. For the first time since the waters overflowed it the wilderness became populated. In the expressive language of the Elizabethan age, it "afforded overmuch harbour to a rude and almost barbarous sort of lazy and beggarly people." At length the period arrived when private enterprise and capital were directed to the reclamation of the fens. In 1630, Francis, Earl of Bedford, with 13 gentlemen adventurers, undertook to drain the level which bears his family name, "on condition that they should have 95,000 acres for their satisfaction." The work which he thus commenced was continued during the Commonwealth by his son William, the first Duke of Bedford, who, assisted by a new company of adventurers, completed a great number of channels to relieve the natural drainage of the fens, and render the whole district fit for cultivation. So great was the progress thus effected that in 1652, 22 years after Francis Earl of Bedford began the work of improvement, we find it recorded that there were "about 4,000 acres thus sown with coleseed wheat and other winter grain, besides innumerable quantities of sheep, cattle, and other stock, where never had been any before." The success of such undertakings is always catching. Companies of adventurers were formed on similar terms to drain other portions of the fen districts, and even Charles I. himself undertook the improvement of the Eight Hundred Fen, providing for himself a recompense of 8,000 acres. In the reign of Charles II. a corporation was established for the continuance and preservation of the works of drainage in the Bedford Level. The Duke of Bedford was made governor of this body, which has ever since conducted the affairs of the Level, and which consists of six bailiffs and 20 conservators annually chosen. In other districts a similar system of management was adopted. Subject to the general control of commissioners and corporate bodies individual enterprise in drainage grew up, and the skill of distinguished engineers was largely resorted to. The upland floods were arrested in their progress by catch-water channels, and thus prevented from deluging the low grounds. Where the accumulation of water could not be prevented by ordinary means the power of windmills was resorted to, after the fashion in Holland; and lastly, that source of relief being found uncertain, the steam engine has of late been extensively employed. Mr. Clarke, of Long Sutton, Lincolnshire, in his admirable account of the Fen district, published in the *Royal Agricultural Society's Journal*, mentions that there were in 1847 about 250 windmills and from 40 to 50 steam engines constantly at work in carrying off the drainage from those lands where a natural outfall could not be secured to it. By these means 680,000 acres of land have been brought into cultivation, instead of being, as Dugdale describes it—

"A region of wild and swampy country, partly cultivated, and partly overflowed, by which overflowing in the winter time, when the ice is strong enough to hinder the passage of boats and yet not able to bear a man, the inhabitants upon the Hards and the banks within the fens can have no help of food, nor comfort for body or soul, nor supply of any necessity save what those poor desolate places do afford. And what expectation of health can there be to the bodies of men where there is no element good?—the air being for the most part cloudy, gross, and full of rotten harrs; the water putrid and muddy, yea, full of loathsome vermin; the earth spongy and boggy, and the fire noisome by the stink of smoking hassocks."

With regard to the character of the soil thus redeemed for the use of man, it consists principally of an alluvial deposit, the chief feature of which is a blue calcareous clay. On this, as a substratum, there extends from Cambridge northwards to Lincoln an immense crust of peat land or turf, in length about 80 miles, and varying considerably in breadth and thickness. At one point it is 24 miles broad, but the average may be stated at 10 miles. In some places it is several yards in thickness, in others only a few inches. This peat land or "black fen" is formed of decayed vegetable substances, and has in its natural state all the absorbent qualities of a sponge; but when mixed with the clay beneath, its defects are remedied and it becomes very productive. Nearer to the sea, and principally in Lincolnshire, the alluvial clays and sands of the fen district remain uncovered by any peat deposit, and bordering upon the ocean the soil is formed of loam and silt, which constitute the marsh district. These last-mentioned descriptions of land extend from Lynn through Wisbeach, Holbeach, and Boston to Wainfleet, and for some distance along the sides of the rivers which discharge into the Wash. Mr. Clarke estimates that they embrace upwards of 130,000 acres. The whole level of the fens may now be said to be almost freed from the dominion of the waters with which it once was flooded. Even Whittlesey-mere, if it is not already drained, is destined to be so shortly; and Ramsey-mere, 560 acres in extent, "has now farm buildings on its bed, a good gravel road running through the middle of it, and produces fine crops of wheat and oats." But the march of improvement is never at an end, and accordingly we find that in this great district, though much has been accomplished, much still remains to be done. Large portions of the land still require under-drainage—a process which the frequent ditches by no means render unnecessary. There are still many districts the watercourses of which are so flooded as to render their proper cultivation impossible. It has been ascertained that where no natural outfall exists steam power is preferable to the windmill; it has also been found that by proper arrangements a natural outfall may be secured where formerly it was considered impossible. Attention is now beginning to be concentrated upon the Wash, which, with its shifting banks of mud and sand, has been perpetually closing up the mouths of the rivers that discharge into it, and driving back their waters to flood the land through which they flow. In process of time this evil will no doubt be overcome. Already, by an ingenious and simple process, the channel of the Welland has been deepened and extended several miles into the sea, and it has been proposed by an eminent engineer to conduct all the rivers flowing into the Wash to one general outfall in the centre of the present estuary, banking out at the same time from the sea 150,000 acres of land. The Great Fen Level has ceased to be what the name imports. A long and arduous battle, lasting through many centuries, has given man the victory over the waves. The narrative of what well directed enterprise and capital have thus effected may not at present be uninstructive.

A very general outline of the farming practised in the Fens is all we can hope to give. The soil is of so peculiar a character, and the mode of cultivation so exceptional, that we have not thought it necessary to examine the whole district with great minuteness. On the higher lying lands—that is, those portions called "highlands," which before the drainage of the fens were islands—the land is principally in grass, and that of very rich quality. It is grazed with short-horn bullocks and Lincoln sheep. The bullocks are bought in lean at the autumn fairs, wintered in the straw-yards with cake, and turned out to these rich grass lands in summer. The Lincoln sheep is a mixture of the Leicester breed with the old Lincoln, the produce being of larger size and with longer and somewhat coarser wool than the Leicester. They are fattened at about 20 months old, or perhaps kept a month or two more, when, after yielding a second fleece, they are sold fat, and have attained great weight. The fen farmers buy their stock of sheep at the spring fairs, and are paying for hoggets in the wool at present 30s. each—an unusually low price. These hoggets are put partly on the "seeds," partly on the old pastures. In autumn they are folded on cole or rape, receiving also cake, and as soon as this is consumed, generally previous to Christmas, the sheep are sent fat to market. In the winter feeding of bullocks we found that some farmers were substituting cut straw, with meal and boiled linseed poured over it, for oil-cake, and were assured that in one case, where £900 used to be expended on a large holding in the purchase of cake, a better effect was now produced by £600 expended on linseed and meal. At Thorney we saw an ingenious plan adopted for preventing yard-fed bullocks from annoying each other when feeding. The food is all placed for them in a long trough under the shed, and when each animal goes forward and puts his head into the trough between upright spars, the feeder pulls a string attached to a simple contrivance, by which the whole of them are confined to their places and released again when they have consumed their food.

The fen land is of very various fertility, but it may be divided into that portion which is more inland, and consequently a fresh-water deposit, and that which lies nearer the sea, and has in the course of ages been formed by the reflux of the tide. The first has usually a surface of black vegetable mould, varying from a few inches to a foot or more in thickness, lying on a bed of clay; the last is a strong silty loam, of more or less thickness, also incumbent on clay. The first, from its porous character, is not generally in need of surface drainage; the last cannot be profitably cultivated without it. The first produces every description of crop with the greatest luxuriance, being friable and easy to till, and readily cleared of root weeds. The latter is generally too stiff for the profitable growth of green crops, is easily injured by the trampling of horses or the use of the plough in wet weather, is much more dependent on the seasons for the quality of its produce, and much more difficult to keep clean and free from root weeds. Oddly enough, with all these disadvantages, it seems to bear the higher rent of the two, so that it is not to be wondered that the farmers of the clay fens are not so prosperous as their more fortunate neighbours on the black land.

The principal thing to be attended to in the management of a fen farm on the black land is to keep the outfalls and ditches throughout the farm open. Some think that all the water should be drained off from the ditches; some think that in dry weather in summer the crops are much benefited by the cool stratum which is maintained beneath the working soil by the presence of water. Practically the water is kept in the ditches at about two feet from the surface, thus serving as a fence betwixt the fields and affording water to the stock. The land is so very level that by arranging the sluices at the main outlets of the farm each man may keep such a depth of water as suits his fancy. The next process in fen farming is to give solidity to the black vegetable mould, and that is done by digging trenches at certain distances into the clay, and throwing it over the surface. A trench two feet deep and two feet wide is made along the field, and the clay which is taken out of it is laid four yards over the surface on either side of the trench. The same process is repeated throughout the field, a new trench being opened eight yards apart from the last. The cost of this operation is about 35s. an acre, and is a permanent improvement, not requiring to be repeated during a lease. It is usually done in the division to be fallowed, as the clay has then time to work down among the soil before a crop is sown on it.

The course of husbandry pursued is not very definite, most farmers being permitted to farm as they think best, or at all events according to the custom of the country; and as that custom is by no means certain, the farmers have sufficient latitude. The following is the system we found pursued on a well managed farm on the Duke of Bedford's estate at Thorney, in Cambridgeshire. The farm consists of 600 acres, 200 of which are "highland" in permanent pasture. The rest is cultivated as follows:—(1) Fallow, with root crops, (2) oats, (3) wheat, (4) seeds, (5) wheat, (6) beans, (7) wheat. The fallow is well wrought, pulverized, and cleaned. It is then dunged with eight or ten loads an acre, and a portion planted with potatoes, carrots, mangold, and swedes. The larger portion is reserved for coleseed, which, after the dung has been applied and ploughed into the land, is drilled with sixteen bushels of bones mixed with ashes to the acre. This is usually sown in June, and is ready for the sheep in autumn, one acre affording keep for eight or ten sheep twelve weeks. The other root crops having been taken up when ready, the land is ploughed and sown early in spring with oats, as it is then in so rich a state that a wheat crop would run too much to straw and be spoiled. The oats yield from 80 to 100 bushels an acre, and as much as 120 bushels have been got off a black coarse variety. After the oats the ground is ploughed and sown with wheat, which is drilled and carefully hoed in spring, wherever weeds make their appearance. Clover seeds are sown among the wheat, in equal quantities of red, white, and trefoil, for sheep pasture, and of red alone where it is to be cut for hay. Next year the seeds are pastured with hoggets, of which they carry from seven to eight an acre, and a few beasts on the field besides. They are ploughed up in October, and the land is again sown with wheat. After the wheat is removed a slight dressing of dung is ploughed in, and the following spring the land is drilled with beans. The beans are kept as clean as possible by horse and hand-hoeing, but being a dirty crop it is necessary to plough twice and work the land well after them in preparation for the last crop of the course—wheat. There is not much difference in the yield of the wheat in the various places it takes in the rotation, 44 bushels an acre being reckoned a good crop. The grass land, as already mentioned, is old pasture land of rich fattening quality. 30s. an acre for land under tillage is expended in labour. The farm is tithe free, rent 30s. an acre, and poors rate 2s. 6d. a pound.

Labourers' wages here are 9s. to 10s. a-week, and their cottage rents £3 to £4 a-year. The picturesque village of Thorney, standing in the centre of the Duke of Bedford's estate in this quarter, 18,000 acres in extent of rich and valuable land, is ornamented by a new street of labourers' cottages, recently completed by the Duke. They are very handsome, with many conveniences, the apartments being complained of, however, as too small. With good gardens attached to each they are let at very moderate rents. Very few of his Grace's tenants hold on lease, though many of them have been on their farms for generations; but the most perfect confidence is felt by them in the high character of the family with which they have to deal. They live at rents which previous to the present great depression of prices might be reckoned very moderate.

Passing from this to the Wildmoor Fen above Boston we get into a different soil, this being a stiff clay loam incumbent on clay. On this soil it is necessary to drain with pipes or tiles, and the outfall now is sufficient to admit of this being done to a depth of three or four feet. At this depth the drains are usually made eleven yards apart, a very frequent arrangement between landlord and tenant being for the former to supply the tiles and the latter to put them in. A vast amount of drainage yet remains to be done, the difference in condition of a drained and undrained farm being very perceptible to the traveller. Where draining has not been done the farmers are rapidly losing money; and even where it has, this land is so entirely dependent on the prices of grain that the present depression is telling seriously upon them.

The following four-course shift on a farm of 176 acres may be taken as a specimen of the routine of one of the better managed drained farms in the district:—(1) Fallow, with roots and coleseed, (2) wheat or oats, (3) clover and beans, (4) wheat. More than half of the fallow is sown with coleseed, to be eaten off with cake by sheep; the rest is sown partly with mangold, partly with swedes and white turnips. Night soil, got from Boston, and mixed with earth, is drilled in with the seed of these different crops, at the rate of ten loads an acre. All the ground that can be early enough cleared of roots is sown with wheat, and the rest in spring with oats, the clover seed being sown at the same time on the half of the division. The other half is dressed with dung and ploughed for beans, which are drilled early in spring. After the clover has been eaten off, about the end of August, the land is ploughed and harrowed, and ploughed again, receiving, as it were, a second fallow, when it is got into a fine friable state and sown with wheat. Dung is either laid on previous to the last ploughing, or is carted on to the ground during frost, and laid over the young wheat, which is considered an excellent plan. Some only plough the land once, but harrow it five times (the horses walking in the furrows which divide the "lands"), and then drill in the wheat. 30 bushels of wheat and 50 bushels of oats may be reckoned average crops. The best farmers give cake in their yards to the cattle, five tons per 100 acres being considered a very liberal expenditure. Guano, or other artificial manures, are but little used. Rents vary, according to circumstances, from 27s. to 40s. an acre.

The crop of wheat last year on this description of land yielded very badly. Unlike the dry, light lands of the eastern counties, which produced more than an average crop, these heavy soils fell short of their usual growth nearly eight bushels an acre. The low price tells, therefore, very strongly here, and many of the farmers are permitting necessary operations—such as the cleaning out of the main drains—to remain unperformed from inability to pay. No reduction of rent of any importance has yet taken place, and in one instance where a representation by a body of tenants was made to their landlord on this subject, the only reply they received was a notice to quit sent to the man whose name stood first on the list. Much of the land in the Fens is held by small proprietors, many of whom are understood to be heavily mortgaged.

WHICH IS THE BEST STRAWBERRY FOR GENERAL PURPOSES ?—It will be in the recollection of most of your readers that I ventured to express an opposite opinion on the merits of the "Black Prince" strawberry to that so confidently expressed by the leading writers in the *Chronicle*, as well as partially in your own; but I need not tell you that different gardens and gardeners produce very different results, and what may prove good in one place does not prove that it must be so everywhere. I had the happiness this week of visiting one of the best gardens in England, and over it presides one of the best gardeners. The strawberry-house I visited with interest, as well as all the other forcing houses, and which, by the way, evinced first-rate management. But I found that for early forcing our friend had been advised not to try, but to grow the Black Prince in quantity, and the result is that it has proved (what I proved) scarcely a good third. I might dilate on the dangers that kind-speaking, pleasant-writing friends may do, and sometimes effect—I grant not designedly, but not the less truly. However, I choose rather to send you a pot of the strawberry I had found preferable; and from this sort we have been gathering similar fruit since the 1st inst., several of which, when weighed singly, were from ½ to ¾ of an oz., which, taken with the number of which I send a sample, it may be considered a fair crop, and a commendable sort.—G. M'Ewen.—[The pot, a 24 size, contained a strawberry plant bearing 13 nearly equal-sized and equally-ripe fruit; nothing could be more perfect and beautiful. Is it so with the Black Prince elsewhere ?]—Gardeners' and Farmers' Journal.

NEW AND VALUABLE DISCOVERY IN LAND DRAINING.

It is well known that several implements have, from time to time, been invented for the purpose of facilitating and economising the cutting of drains, and many powerful ploughs have been constructed with that object; but none have been hitherto found capable of meeting the *grand desideratum*. We are happy to say, however, that we can at length announce the accomplishment of this important object—so far, at least, as the present recent trials have gone.

One of the warm supporters of our journal, Mr. Cotgreave, of the Rake farm, near Eccleston, in the neighbourhood of Chester, has at length vindicated his county, long stigmatised as the most backward of all English counties in adopting the improvements of the age, in every thing which relates to the amelioration of its most unyielding soil; how far this stigma may be deserved, after the efforts made to give to drainage something like a system, by the promotion of a Drainage Company, and still more recently by the invention we now notice, we leave to others—for ourselves we are content to mark the progress of events, not doubting that justice will one day be done to the county, as well as to the individuals whose aim has been to render the clay farms of Cheshire all that they are capable of becoming, and that we are bound to say we consider *very productive*. We have no doubt that many landowners have hitherto abstained from draining their estates, because of the great outlay required; now, however, when they find that cutting the lateral drains can be efficiently executed for one-half the former cost, besides effecting a considerable saving in time, there will, we trust, be in this part of the kingdom, few farms undrained.

We have not yet had an opportunity of viewing the work which has been done at the Rake farm by Mr. Cotgreave, but shall avail ourselves of an early opportunity of doing so, as soon as the inventor has completed his arrangements for exhibiting his system in full work, when we will give our readers the result of our inspection.

The Marquis of Westminster, who at present is extensively engaged in draining his estates, and other eminent agriculturists in the neighbourhood, have expressed their approval of this ingenious invention.

At present we content ourselves with giving the following extract from a newspaper of the neighbourhood, and we fondly hope that our close examination of Mr. Cotgreave's implements and mode of operation will enable us to stamp the process with our approval, as one worth the consideration of our readers:

"We cannot commence our labours in a manner more advantageous to the public, and more satisfactory to ourselves, than by laying before our readers some results of a new discovery in this neighbourhood, which it appears to us is calculated to secure most important and immediate benefits to all connected with the cultivation of the soil. We allude to Mr. Cotgreave's (of Eccleston) new practice of draining, in which three vitally important considerations are comprehended, viz.—economy of outlay, economy of time, and increased employment of labour, with its judicious and profitable distribution.

"Mr. Cotgreave's principle consists of a series of ploughs derived from the carpenter's plane; in fact, it is nothing more or less than a land-plane; and when seen, every one must wonder why the principle now brought into operation has not been applied years ago. With the exception of the main drains, all the work, even to the obtaining the perfect level of the drain, is performed by the plough-plane. Mr. Cotgreave has so adapted his plough that with four horses he can throw out a drain from four to five feet deep. The saving of time is another material object. The work by this process is almost incredibly expeditious, and very little damage is done to the surface; indeed, in grass lands a heavy roller will repair all damages. *The cost of workmanship is half the price of manual labour on the present system, and the time occupied one-tenth*; while the work, to say the very least, is as efficiently and durably performed.

"In the neighbourhood where the plough has been used, much has been said of the probability of the implement throwing many men out of employ. This we contend is erroneous, because the want of such an economical implement has hitherto prevented draining to any great extent being carried on. As the agricultural markets now are, the farmer too frequently says, with truth, 'such a field is so wet and poor, I cannot work it.' Consequently that land is thrown out of cultivation; and, as land is abandoned to take its chance, so the assistance of labourers is dispensed with. Poverty and poor-rates increase; and crime inevitably follows in the wake. But if the expense of draining is brought within compass, then, as a matter of course, more land will be drained, more labourers permanently employed, and the agriculturist will have a chance of so increasing his produce, that he may earn a livelihood, and, by extra exertion, something more.

"The working of the plough-plane is a problem many may doubt: we did so; but we saw, and were convinced of its powers and efficiency.

"All who have witnessed the operation of Mr. Cotgreave's draining plough are unanimous in their approbation of the plan, and their conviction of its full and complete success.

"We are desirous of calling the attention of the landowners and holders to the actual merits of this most clever adaptation of the plane, deeming that merit of every kind imperatively commands the attention of the public press most particularly.

"Mr. Cotgreave has, most fortunately, that kind of education which is well adapted to his occupation, viz., that of land-valuer and surveyor. His experience as a land-valuer has been called into operation by the Tithe Commutation Act to a great extent; and for the performance of the duties thereto annexed, he must, of necessity, have considerable knowledge of the nature of soils generally. Added to this, he has a large clay farm in cultivation, in his own hands, the treatment of which needs no more reference from us, save that those who wish to know how he works it can see, if they will visit his farm.

"We now proceed to the detail of the plough: We find that the necessary staff of men is ten, and of horses four; and with this at command Mr. Cotgreave will be enabled, without distressing either horses or men, to commence two statute acres in the morning, and finally complete, that is, cut the drains (including the main drain), lay the pipes, fill in and make good the surface of one statute acre, and half prepare the second to be ready for work the next day. The plough, as we have already explained, is on the plane principle, and, by means of screws, can be adapted as occasion requires, even while in operation in the cutting, to take a shaving of two, three, four, five, or six inches in depth. This control of the plough is most necessary, as it must be evident that certain portions of the land requiring to be drained frequently have undulations; and if there were no regulating principle, it is quite certain no water level could be obtained by a plough. This point we particularly impress on the attention of our readers, because every practical man at first would inquire how this difficulty is to be overcome.

"Again—How is the plough to work when a stone obstructs it? This has been considered by Mr. Cotgreave and provided for. If the stone is too large to pass along the plane, or too deep to be turned up by the cutting in operation, the coulter of the plough is so formed as to protect the share, and with a lever and hooked instrument the stone is removed ere the plough returns, when the *debris* of the obstruction, in addition to the shaving (if we may so call it) then in process of casting out, are removed at one and the same time.

"One of its great recommendations is that it is adapted to every variety and condition of soil, and that it can be worked almost independently of the weather, unless the frost is very intense. In fact, those who have witnessed the plough at work are at a loss which most to admire—the absence of complexity in the contrivance, or the rapidity and perfect success of the operation.

"For the purpose of expedition and efficient workmanship, the landowner ought, before commencing with the plough, to have the pipes of both mains and tributary drains *in the field*.

"Mr. Cotgreave's system is to commence with spades, and complete the whole of the main drains before he begins with his plough. He then casts out, with his plough, the clod, measuring six inches square, on the left side of the intended drain, over the compass of two statute acres. This is of great advantage where there is much surface water, as the process of draining immediately commences and renders the land less liable to damage by the treading of the horses; and the main drain being cut, the water percolates to it, and so passes off. He then returns to the first acre, and with the same plough casts out on the right-hand side the subsoil. To attain the depth of eighteen inches by six inches wide, he requires four drafts—viz., the first 6 inches, the remaining three 4 inches each. The plough is then changed for one which will cast out its shaving two inches wide by six inches deep. With this he attains a level bottom. Then commences the pipe laying. To insure the level, a gauge is passed along the bottom of the drain. This effects the double object of clearing any fallen soil out, and forming a perfect bed for the pipes. As the drain is too narrow to admit of a man getting into it, a new process of laying the pipes is adopted—viz., threading them on a half-inch iron bar, the one end trailing in the drain and the other end in a man's hand. The rapidity and perfectness with which the pipes are thus laid is surprising. A man then follows with a sort of paddle, with which he completely adjusts the pipes, and if there are any spaces by breakage, or otherwise, he repairs the damage. The drain is then ready for filling up, which process again is rapidly executed, and the first clod, in almost *one entire piece* the whole length of the drain, is rolled on to its bed.

"We think we have said enough to excite a reasonable curiosity in all to witness the operation of this valuable implement, and a natural desire on the part of agriculturists to profit by a process so easy in its application, so effectual in its results, and the benefits of which can be appropriated at HALF THE COST, AND IN ONE-TENTH LESS TIME, than the prevailing practice. Mr. Cotgreave is now making arrangements for exhibiting his system in full work within a few miles of Chester; when our readers may have an opportunity of inspecting the plough and its operations."—Farmer's Herald.

ON THE MOST SUITABLE PROPORTIONS AND QUANTITIES OF GRASS AND CLOVER SEEDS TO SOW FOR HAY, SOILING, AND PASTURGE.

At a monthly meeting of the Highland and Agricultural Society, held on Wednesday, the 12th ult., Mr. Milne, of Milnegraden, in the chair—

The Chairman intimated that the subject for discussion was—"The most suitable proportions and quantities of Grass and Clover-seeds to sow for Hay, Soiling, and Pasturage, the substances most profitable for top-dressing, and the proper time to apply them."

Mr. SCOTT, Craiglockhart, then said—The successful cultivation of grass is at all times of importance to the farmer, whether if cut as forage or depastured; as, in proportion to the quality and quantity of the grass grown, so will he be enabled to keep in good condition or fatten a number of animals, ultimately to be converted into money, the manure obtained from which will also go to enrich the land for future crops; or if in a situation for selling hay or grass, in like proportion will be his money returns from that division of the farm. In regard to the seed to be sown for hay or grass for soiling, where the land is not clover sick, nothing is so profitable as red clover, *Trifolium pratense*, with a mixture of annual ryegrass, *Lolium perenne*, and Italian ryegrass (*Lolium italicum*); say at the rate of 10 lbs. of red clover, 10 lbs. annual ryegrass, and 10 lbs. Italian ryegrass, per Scotch acre. But where the land has become clover sick, I have been in the practice of adding to the above mixture 3 lbs. of white clover, *Trifolium repens*, and substituting 4 lbs. of cow clover, *Trifolium pratense perenne*, for a like quantity of red clover, and I have reason to believe that a mixture of Alsike clover, *Trifolium hybridum*, would also be beneficial; the high price of this clover may have prevented its being sown extensively; but I understand it may now be obtained at a more moderate price, and its cultivation deserves attention. In regard to seeds for two or three years' pasturage, a common practice has been to sow about 5 lbs. of red clover, 5 lbs. white clover, a small portion of yellow clover, *Medicago lupulina*, with from 20 to 30 lbs. perennial ryegrass, per Scotch acre; and in some instances cutting the first year's crop for hay—a practice which cannot be too much condemned, or too soon exploded. Of the *Lolium perenne* there are two distinct kinds—the one biennial, commonly known as annual ryegrass, which having once borne its seeds the root decays; the other perennial, which, from circumstances of soil and culture, has been divided into a number of varieties at different times fashionable, such as Ayrshire, Pacey's, Moles's, Russell's, &c. But I have doubts if there is any important distinctive difference between these varieties; and as to yellow clover, I have great doubts if it ought ever to be allowed a place amongst cultivated grasses; there are also objections to much red clover being introduced into permanent pasture, in so far as it seldom appears the second year; whilst in the first season, by its rapid growth and broad leaves, it is apt to check the growth of the smaller but more permanent plants. The great object which it is desirable to attain in laying down land to pasture is to have an early growth with a succession throughout the season of succulent herbage; therefore, although the ryegrass, from its early maturity, the wide range of temperature and soils where it will grow, and the abundance and facility with which its seeds can be raised, will always make it an important grass for either hay, soiling, or pasture; yet, from the circumstance of its principal growth being towards raising a seed stem, which is not readily eaten by sheep or cattle, and after the seed is matured, a considerable time elapses before it again sends forth any young leaves, in consequence of which, where it forms the principal part of the herbage, we too often see in the months of July and August many fields presenting little else but withered stems. It is, therefore, requisite, in order to obtain a succession of green and succulent herbage, that we endeavour to imitate nature, by mixing together those grasses suited for the soil and climate, and which will come to maturity at different times; so that as nearly as possible a uniform growth of such plants may be kept up during the season. With this view, I believe that, although in some particular instances, a greater variety of seeds may be necessary, on most well cultivated soils the following mixture will be found to produce a superior pasture, viz., per Scotch acre:—

	£	s.	d.
Dactylis glomerata, rough cocksfoot, 5 lbs., at 6d.	0	2	6
Festuca pratensis, meadow fescue, 3 lbs. at 6d.	0	1	6
Phleum pratense, meadow catstail, or Timothy grass, 2 lbs., at 6d.	0	1	0
Lolium italicum, Italian ryegrass, 10 lbs. at 6d.	0	5	8
Lolium perenne, perennial ryegrass, 10 lbs., at 3d.	0	2	6
Trifolium pratense, red clover, 2½ lbs., at 6d.	0	1	3
Trifolium pratense perenne, cow clover, 2½ lbs., at 8d.	0	1	8
Trifolium hybrydum, Alsike clover, 2 lbs., at 1s. 6d.	0	3	0
Trifolium repens, white clover, 3 lbs., at 7d.	0	1	9
	£1	0	2

There is no doubt the prices of some of these seeds are at present comparatively dear; but if they were more generally used, so as to cause an annual demand for them, their cultivation would become an object worthy of attention to seed growers, and they could then be obtained at much lower prices than now, when they are only articles of occasional request. In regard to the substances most profitable for top-dressing, I propose to confine myself to those substances only which are usually termed light or portable manures—soot and the liquid drainage of the byre. With regard to the application of any of these to pasture land, although for particular purposes they may be applied with advantage, yet for general use I am not aware that any of them can with profit be extensively employed. However, those substances applicable for hay or soiling grass, with the exception of soot, are just those that will benefit pasture land; and as a top-dressing for hay or soiling grass, several of the light manures can be applied with decided advantage, not only for affording an earlier supply, but also for yielding a larger crop. Where the means of saving and applying the liquid of the stables and byres exist, it is probably the cheapest and most effective fertilizer that can be employed, but there are circumstances attending its application which interfere with its being extensively used; for, if applied in the autumn or winter season, little benefit will be derived; or if put on in dry weather late in spring, it may either be of no benefit or decidedly injurious; and at all times its application should be avoided in windy weather, or when much evaporation is going on, as, from the volatile nature of the ammonia present in the liquid, if applied in such circumstances much of it will be lost. The best period for its application is in moist weather, about the end of February or beginning of March; and again in moist weather after the grass has been cut, by which means an early cutting will be obtained, and a good second and sometimes a third cutting may be got off the same ground in the course of the season. However, the difficulty of storing up a sufficient quantity, the season and state of the weather in which it requires to be applied, with the amount of cartage necessary, are obstacles which have hitherto impeded its extensive application, but which do not apply to those substances generally termed light or portable manures. We have occasionally had reports of the wonderful benefits derived from the use of gypsum, bones, sulphate of magnesia, sulphate of soda, and muriate of soda or common salt; but however beneficial these may be in particular instances, I am inclined to believe that, for general use, the value of any application as a top-dressing to grass will just be in proportion to the quantity of ammonia which they may contain, or the elements they possess capable of being converted into ammonia in the soil; but whether such ammonia goes directly to the growth of the plants, or whether it acts upon substances previously present in the land, is too wide a field for discussion to be entered upon on the present occasion. However, in whatever way the ammonia does act, I have reason to believe that in practice it will be found to be the chief agent in increasing the yield and giving an earlier growth of grass and clover; and there are several substances which may be easily obtained and beneficially used for this purpose, such as soot, nitrate of potash, nitrate of soda, sulphate of ammonia, and guano, the propriety of using one or other of which will depend on their cost, in proportion to the quantity of ammonia, or the elements they may contain from which ammonia may be obtained. In regard to soot, it requires to be put on in much larger quantities than any of the other substances I have mentioned, and its application is at all times a very dirty operation; whilst, from its not readily combining with water, it requires a much greater quantity of rain to dissolve and carry it down into the soil than the others; and should it lie on the surface of the ground for several days very little benefit will be obtained from it. At the same time it is more variable in its composition than any of the others. According to Johnston, the amount of ammonia it contains varies from one to five per cent., from which causes its effects are generally very uncertain. With regard to nitrate of potash, its comparatively high price has hitherto, and is likely to continue, to prevent its being generally used, but the others have been extensively and successfully employed; and so far as my experience can lead to form an opinion, the following quantities of these substances, per Scotch acre, if applied under favourable circumstances, will produce nearly equal results :—

1¼ cwt. sulphate of ammonia,
1½ ,, nitrate of soda,
2 ,, peruvian guano.

Those are the quantities of these several substances which I have found it most beneficial to apply, but of course cases will occur where it will be proper either to increase or diminish them, and they ought always to be applied in moist weather, so that they may be dissolved and carried down into the soil; this is more particularly the case with nitrate of soda and guano, as should they be allowed to lie on the surface for a few days a considerable part of their value will be lost, but the sulphate of ammonia may remain on the surface for several days without much loss being sustained. However, it is a safe rule that whenever any of this class of fertilizers is employed, the sooner they are incorporated with the soil the better; and whether it may have arisen from these causes, or from greater difference in the purity of the substances employed, or from other causes of which I have not been sufficiently observant, the results from the use of sulphate of ammonia have been more uniform than that of either of the other two substances. I have applied these substances from the end of February to the end of April, with little difference of results, provided a sufficient quantity of rain fell immediately afterwards. However, I am inclined to think that to secure such taking place it is better to apply them in the end of February. But there is one objection to their being applied at an earlier period; for if the vegetation be forced too early in the season, there is a risk of frost cutting off the growth that has been made. In one instance, when I had applied the top-dressing at an early period, a severe black frost had the effect of cutting three to six inches off the points of the grass; while another portion of the field, to which the top-dressing was applied at a later period, came to be both the earliest and heaviest crop. With these imperfect observations, I shall leave the discussion in the hands of the meeting, trusting that some of the gentlemen present, who, I am fully persuaded, are much better qualified than I to do justice to the subject, will favour the meeting with their views, and correct any omissions or mistakes into which I may have fallen.

Mr. **Dingwall**, Ramornie, said—In discussing the subject before us, I presume it will be unnecessary to enter into a minute detail of the numerous kinds of grasses considered suitable for permanent pasture. It may be preferable to confine ourselves to those which may be considered most profitable for alternate husbandry. For this purpose, where grass is not intended to lie for more than two or three years, nothing appears to have proved more remunerative than the different kinds of clover and ryegrass in general cultivation. Their early maturity, the large amount of succulent and nutritive food they are capable, under good cultivation, of producing, the regular succession in which they follow and give place to each other during the season, their adaptation to the climate, and the comparatively little outlay required for seed, point them out as, on the whole, well adapted for ordinary cultivation. Of the clovers, the common red, where it can be at all successfully grown on ordinary land in good condition, will assuredly take the first rank either for hay or soiling, and in mixture for pasture. Cow-grass, although apparently less liable to those failures to which the red clover is in many cases so subject, can scarcely be compared with the latter in the quality of its produce. From the risk of failure in red clover, the cow-grass will, however, be found valuable in a moderate mixture in order to secure a sufficiency of plants between them. From its being a perennial, it appears also very suitable for mixing with other sorts of pasture. The only kind of rye-grass I have been in the habit of sowing for all purposes is the common perennial, as genuine as can be procured, and occasionally sown from the second year for better security against degeneracy. There seems to be a great difference of opinion in regard to the merits of Italian ryegrass. Many, while allowing its useful qualities when sown by itself, or with some red clover for soiling, have at the same time a prejudice against its being mixed with other plants either for hay or pasture. Its tufty habit is alleged to have a very injurious effect on common ryegrass or clovers sown amongst it. Another objection I have heard stated against it is, that where it has been grown, it is difficult to extirpate the creeping roots it is apt to form. Although Timothy grass may be in some respects profitable, I have been induced to discontinue its growth, in consequence of the difficulty of clearing the ground of the bulbous roots it is apt to form, which renders it troublesome in alternate husbandry. This tendency may, however, be stronger in some soils than others, having appeared in my case to be more prevalent on the dry light soil than on the moss or clay. The quantities and proportions of seeds will vary considerably, according to the soil, the climate, and the purpose for which they are sown. My own practice in growing hay has been to sow at the rate of nearly one bushel of ryegrass, 7 lbs. red clover, or partly red clover and partly cow-grass, and from 1 lb. to 2 lbs. of white clover, per imperial acre. This quantity, calculating from the estimated average number of seeds per oz., according to Messrs. Lawson's tables in their valuable work on the Cultivated Grasses, will allow about 180 seeds to the square foot, or considerably more than one to the inch, of which much the larger proportion is ryegrass. Were the same number of plants to be produced it would be necessary to diminish the quantity very considerably; but as from the uncertainty of the braird and many other casualties comparatively a small number may be expected to reach maturity, it will be found in the end most profitable not to be too saving in the quantity of seed. Perhaps a smaller quantity of ryegrass might by many be considered preferable, but when grown for hay the quality is much improved by having a fair proportion amongst the clover. For soiling, there is no doubt that considerably less ryegrass might be profitably employed, and more dependence placed on the clover. I should, however, hesitate to dispense with it altogether in our climate, which is much better adapted for its growth than many counties in England, in which it is little valued on account of the difficulty of growing it successfully in the hotter and drier districts. For pasture, which in my ordinary rotation I seldom allow to lie longer than one or two years, I generally sow about one bushel of ryegrass, 5 lbs. of cow-grass, or the same quantity of a mixture of red clover and cow-grass, nearly 4 lbs. white and sometimes from 1lb. to 2lbs. of yellow. This, if the ryegrass is kept down by moderately close eating up to the beginning or middle of June, appears very suitable for the generality of pasture lands. With regard to the most profitable application as top-dressings for grass, I have always found the liquid manure of the farm prove itself highly valuable when applied at the proper season. It appears eminently qualified both to hasten the growth and largely to increase the produce of grasses in every kind of soil. There is often annoying evidence of its effects in the unsightly appearance of a field which has been carelessly gone over with a water cart, every awkward turn being visible at a great distance. It has this disadvantage, however, when used for grass in a liquid form—that without large and expensive tanks it cannot be reserved for application at the most profitable season. Where liquid manure has not been applied, I have been in the habit of regularly going over the remaining hay crop with nitrate of soda and sulphate of ammonia at the rate of from 1 to 1¼ cwt. per imperial acre. At first they were experimented on separately; but as the nitrate appeared to act most powerfully on the ryegrass, and the sulphate on the clover, they have latterly been used in mixture with excellent effect. By their means the crop has not only been invariably greatly and profitably enlarged, but has generally been fit for cutting fully a fortnight earlier than any portion of the field where nothing has been applied—a matter of much importance in a late season. These substances appear to be of great value as top-dressings on soils which are either naturally or artificially in a fertile state, stimulating the plants to send out roots, and appropriate the food placed within their reach. Under these conditions I have generally found them superior in their effects to guano—the only instance in which the latter took the lead being on part of a poor mossy field, where it produced a heavier hay crop than the nitrate of soda alone. In this instance, where there may have been a deficiency of phosphates it might have been profitable to have mixed them, or even to have added some dissolved bones in as soluble a state as possible. I have never tried the guano mixed with the nitrate and sulphate, but the experiment might be useful. Separately these all proved themselves profitable; but generally when the land is in that condition in which it ought to be after a proper preparation for grass, especially for hay or soiling, I would be inclined to give the preference to the mixture of nitrate and sulphate as above. The time for applying these top-dressings is a point of much importance. From their soluble nature, if applied too early, they are apt to be washed too deep into the soil, or, at the best, to lie inert and subject to loss until vegetation has commenced. If, on the other hand, they are delayed too long, there is a risk of not reaping their full benefit, from the late and short period of their action, and the hazard of the occurrence of dry weather, which might prevent them from being of any benefit. In my experience with liquid manure which has been carted on the grass land at all seasons, I have invariably found that when it was used in the autumn it was beneficial until vegetation was checked by the approach of winter. For two to three months during the winter when it has been tried at that season it has been of little survice; but as the spring advanced, the effects on the crop have always visibly and steadily increased up to the time when the plants were stimulated into action by the increase of temperature. When applied at this period, the crop has uniformly been heavier and earlier than at any other season. This would indicate that the earliest opportunity after vegetation has fully commenced should be embraced for applying any soluble top-dressings which may be necessary. In average seasons, it will be found advisable to take advantage of *showery weather*, from the end of March to the middle of April; or in the event of dry weather, as soon afterwards as a suitable opportunity offers itself. In this, as in other points of farm practice, we must be guided in a great measure by circumstances, but when a principle is steadily kept in view, there is in general, with ordinary foresight, little difficulty in applying it to practice.

Mr. **Douglas**, Athelstaneford, said—In complying with the request of the Directors of the Highland and Agricultural Society to state my opinions and experience on the subject under discussion, viz., "The most suitable proportions and quantities of grass and clover-seeds to sow for hay, soiling, or pasturage; the substances most profitable for top-dressing, and the proper time to apply them," I shall not detain the meeting by any very lengthened statement of my views upon the subject, but shall express myself as briefly as possible, and attempt also to explain the system that I have found most suitable for the land I occupy, and which has succeeded best with me. But in doing so I am fully prepared to hear other members recommending a mode of management that I have perhaps not touched upon, and that with apparently as much success and satisfaction to themselves as the course which I have proved is most beneficial for me to pursue. Such a result, however, only proves that the system of inviting gentlemen from different parts of the country is of the utmost importance, not only to elucidate more clearly the subject under discussion, but to correct any opinion that might go forth to the agricultural public that such a particular mode of management was the best. Statements will be made that are the results of practice, which, although substantially correct as to a particular district, where soil, situation, and climate do not materially differ, yet may admit of considerable alteration or modification to secure the same advantages elsewhere; it thus warns parties not to confide entirely in any one system or treatment—that while they may advantage themselves by the results of the practice of others, they require not to be led away by any particular mode or panacea; but to consider carefully the variety of seeds, and the application as a top-dressing that is best calculated and most likely, under all circumstances, to suit their purpose. As the subject under discussion requires that it should be treated in two divisions, I shall, in the first place, express my views on the first part, viz., "The most suitable proportions and quantities of grass and clover-seeds to sow for hay, soiling, or pasturage," and shall also, with your permission, take the same opportunity to notice the *varieties* of the different grass and clover-seeds that I consider most suitable, under different circumstances, to sow; my excuse for adding this addition to that which we are requested to explain is, that I believe the subject cannot be properly and fully treated without doing so. The proportions of clover-seed required to be sown, per acre, varies a good deal, owing to different circumstances—such as the newness of the soil to the plant, the quality and texture of the soil itself, situation, altitude, as well as the preparation of the land, independent of the difference of variety and quantity, that renders it necessary should be taken into account, when we intend the crop for a particular purpose. When we are sowing down a field for hay we sow the annual grass seeds in preference to the perennial, as they grow quicker and attain to a greater weight; and for the same reason the red clover is preferred to all other varieties—a proportion of cow-grass may be sown along with the red, it being of fast growth, and possessing nearly all the advantages of the former. A small quantity of Italian rye-grass is sometimes added in connection with annual for a hay crop. It does not improve the quality of the hay, but adds considerably to its weight; being a fast grower it draws up both rye-grass and clover; it should not, however, be too thick, as a different result might follow than the advantage here spoken of. Whether the crop is intended for hay or soiling, the proportions and quantities, as well as the varieties of the grass and clover seeds, should in my opinion be the same. When we intend it for pasturage, it is necessary in the first place to consider whether the crop is to remain one or more years in grass, in order that the proportions, quantities, and varieties may be selected and sown, that are likely from their character and tendency to answer the end we may have in view. If for only one year, then the mixture I have recommended for hay will still be found generally the most suitable; it will at least produce most food, if the red clover can be relied upon; but it frequently happens that the lighter soils of the farm are appropriated for pasturage, and in those soils the red clover is frequently thrown out in the autumn, though more generally in the spring months; and to obviate this risk the prudent farmer sows a proportion either of white or Alsike clover, or perhaps both. If, on the other hand, it is intended to remain a longer period in grass, we should substitute for the one-half of the annual rye-grass, perennial seed; reduce the quantity of red clover to one-half; allow the cow-grass to remain, being a perennial, and add white and Alsike clover in proportion, that the surface may be equally well planted as in the former case. Some farmers are in the habit of mixing yellow clover-seed with the others I have mentioned to their pasture fields, and not unfrequently to the crop intended for hay; it is a wiry, and, in my opinion, not a very nutritive herbage, but being a hardy plant, and a fast grower, affords an early bite; is better suited to cold and high situations, or where the soil is poor and thin, and there competes successfully with the other varieties; but on good soils, in favourable situations, its cultivation is very questionable. The proportions and quantities of grass and clover seeds that I have found most suitable for my purpose, either for hay crop or soiling, are per Scotch acre are :

Annual rye-grass, 3 pecks.
Italian do., 1 peck.
Red clover, 10 lbs.
Cow-grass, 2 lbs.
White clover, 2 lbs.
Alsike clover, 2 lbs.

This mixture I also use for one-year old pasture, but when laid down for a longer period, I use the following :

Annual rye-grass, 1 peck.
Perennial do., 2 pecks.
Italian do., 2 pecks.
Red clover, 6 lbs.
Cow clover 2 lbs.
Alsike do., 4 lbs.
White do., 4 lbs.

Making 16 lbs. of clover per acre sown in both cases. I always add a proportion of Alsike and white clover in the mixture for hay, soiling, or one-year old pasture, as I have found when the red clover partially failed, so as to make us abandon our intention of cutting, we could still use the grass as a pasture, and thus provide against a failure, enabling us to continue the rotation which would otherwise have been deranged; or when we have reason to believe that the failure alluded to is on a particular fold likely to take place, the better way will be to sow 6 lbs. of Alsike clover, and leave out the white; that quantity of itself being sufficient to plant the surface of an acre. This species of trefoil will be found to grow freely, and I have proved it to be a very good substitute for the red clover; it pastures equally well with the white variety, and has the extra advantage of being better suited for hay. On strong rich clayey soils, where there is no such risk as that which I have spoken of—the red clover is decidedly the best of all the varieties to sow, and there is no need of any other, except perhaps the cow-grass, which, although inferior, possesses many of its advantages. These clovers, from their large surface of leaf, are better calculated than any of the other varieties to draw from the surrounding atmosphere a good deal of their support; and, for the same reason, grasses, such as Italian and annual, are fast growers, compared with perennial. There are many other varieties of grasses and clovers, independent of the yellow clover that I have already mentioned, which, although inferior in quantity and nutritive powers, must not on that account be entirely overlooked, as, from their hardiness, they can readily adapt themselves to any of our inferior soils in high and cold situations, where the other and finer varieties cannot be grown to advantage; their intrinsic value in this respect is great, as they enable the cultivator to pursue, even under these circumstances, that alternate husbandry which has proved of so much advantage to the country at large. It is generally known that Italian rye-grass is a variety that, even when sown by itself, produces abundant crops of herbage; but the preferable way is to sow it in connection with red or cow clover; it is better adapted for soiling than hay or pasturage, and, when cut green before it goes to seed, is of fair quality and very nutritive. When it is well managed, and sufficiently manured beforehand with farm-yard manure, and afterwards with liquid, it produces an astonishing weight per acre. It is a green food, most valuable for soiling, and just in proportion as the soil, situation, and the treatment it receives are suited to its growth, so does it yield its produce. A moderate-sized field, with a sufficiency of straw, is capable of making manure for a very considerable breadth of land; it prefers a rich deep loam, and should always be grown, if possible, in a convenient field near the farm buildings; a quantity per acre may be grown with signal advantage in pasture grass, as it gives the earliest green bite we know, thus answering an important end to the flock-master. Before taking leave of this division of the subject, I consider it necessary to offer a few remarks on lands laid down to permanent pasture. I think we ought always to select varieties that are congenial to the soil intended to be laid down; this we should endeavour as soon as possible to ascertain, for however good and preferable one species may be in one locality, it may fall far short of other varieties in another, where soil, situation, and other elements are different; therefore, it is of the utmost importance to know those varieties of seeds that succeed best with us. When we lay down land to permanent pasture, our desire is to sow it out in the best manner, or, in other words, with those varieties that will grow most luxuriantly, and give the greatest amount of the richest herbage; of course, in making our selection we will consult our experience, and select those species which we had generally seen most flourishing on our lands; and provided the field we contemplated sowing is much of the same description of soil, &c., as that from which we had obtained our experience, there is little doubt but that we should succeed. There are so many different receipts for proportions and quantities of seeds most suitable to lay down land to permanent pasture, that I consider it unnecessary for me here to furnish one; I may, however, be permitted to remark, that some of them are very conflicting when compared with other prescriptions of the same nature. Generally (in my humble opinion), there are too many varieties sown; for on examining lands that have been for some time in pasture, I have found that a *majority* of the grasses sown at first *soon disappear*, and that other varieties more congenial to the soil and situation take their place. In stating this, I do not desire it to be understood that I am undervaluing some of the compounds at present in use, but only hint that if parties would content themselves with fewer varieties, and abide or be satisfied with those acknowledged grasses that are famous for their green herbage, fast growth, and nutritive qualities, they would have better pastures, and without that coarseness and confusion we frequently see. I have now only to observe as to the precise quantity of clover-seeds to sow; that, properly speaking, there can be no rule for exact quantities, seeing that much depends on the condition of the soil, situation, climate, as well as the land being new to the cultivation of the plant, in addition to the difference (which is sometimes very great) of the seed itself; between English and French, bold and well-matured seed, in comparison with that of middling quality, or even with ill-matured, which, although lighter, frequently grows as well as the strong seed. Seed of the second quality will generally be found as suitable as the two extremes, and may be deemed the safest to sow. It is cheaper than the first quality, and contains fully a fourth more plants, which materially adds to its recommendation. And in continuation of these remarks, I have repeatedly heard parties affirm that they had their land as well planted with 8 lbs. as some fields in their adjoining neighbourhood which they knew had been sown out with double that quantity. I have, however, found that a full supply of seed always succeeded best with me, and never sow less than the proportions I have stated; have sown frequently a *double quantity* on a portion of a field (I speak in relation to grass intented to be pastured), and was satisfied that the portion thus sown was capable of grazing fully a third more stock than the same amount of surface on the rest of the field. I am, therefore, of opinion that it is highly advisable to sow land intended to be grazed only one year with a full supply of seeds, as it is much better to insure an early and thick braird than trust to the plants stocking out and so filling up the surface. Having stated my opinions and practice in relation to the first division of the subject under discussion, I shall now offer a few remarks, and endeavour to express my views as clearly as I can on the second point, viz., "the substances most profitable for top-dressing, and the proper time to apply them." There are various substances that may be applied with advantage to grass lands, such as can be collected and prepared on the farm, or otherwise. Of these, I shall notice first farm-yard manure, well prepared. The collections that can be had from towns, such as the refuse of the slaughter-house, sweepings of streets, saturated ashes, liquid waste, gas lime, soot, &c., also composts formed of new earth, or vegetable matter in connection with lime, and, though last not least, the liquid manure collected from the stock of the farm. These, I believe, have all been frequently used, with greater or less success, according to the quality and quantity applied. But I have found in my practice that, although well rotted farm manure is very beneficial as a top-dressing, it yet can be more profitably employed for other purposes. The refuse of the slaughter-house is both a rich and superior top-dressing, as well as one of the most powerful manures we know. Street sweepings, when good and well saturated with strong liquid, is both a cheap and effective manure; from eight to twelve carts per acre may be regarded as a proper application, which can be had in the vicinity of a town for 30s. to 40s. Liquid waste or sewerage water is also a superior top-dressing, and when we contemplate its astonishing effects on the grass irrigated by it in the vicinity of this city, we are then only convinced of its power as a fertilizing and stimulating agent. I have known five successive heavy crops (white and green) taken from a piece of land that had only been under the influence of the water for a period of six years; but much depends upon the situation—if at a low level for collecting deposit; for when this is not the case the effects arising from the irrigation (when broken up) are not so lasting. Gas lime, when convenient to be had, costs little money; and I have frequently seen very good results from the use of it. Soot (which I shall afterwards refer to in the class of manures best adapted, in my opinion, for top-dressing) is a cheap, portable, and very effective auxiliary to the growth of grass. We are all satisfied as to the benefits to be derived from the application of composts, and where they can be collected it should never be omitted. The liquid manure of the farm, if in sufficient quantity, is the best of all for applying to grass lands. But there are only one class of farmers who, by their system of management, keeping dairy stock, can procure it in sufficient quantity to make it of consequence to use it for top-dressing or irrigation; those farmers who, from the nature of their farms, adopt the system of feeding—and that generally in courts or loose boxes—always find that, if they have a sufficiency of straw for litter, they have seldom or ever any liquid manure. I have, at least, found it so. This brings me to that point necessary to speak of those substances at our command, and not made upon the farm, which we may term portable manures, and belong to the class better adapted, for various reasons, to be used as top-dressing. This list consists of a very numerous class of fertilizers, but it is my intention only to refer and speak of those substances that, in my practice, I have found more uniformly to stimulate and increase the grass crop than any of the others I have used for that purpose. First in my favour stands guano, nitrate of soda, pigeons' dung, soot, superphosphate of lime, dissolved horse flesh, bone dust, lime itself, and common salt. These I shall treat of in their order, and explain the results I have experienced from their use. Guano (Peruvian) and nitrate of soda I have used conjointly, for some years past, as a top-dressing, and always with the most striking and beneficial results; previously to last year I used it in the proportion of 1 cwt. guano to 1½ cwt. of nitrate of soda per Scotch acre, but last year altered the mixture to 1½ cwt. guano, conjoined with 1 cwt. of nitrate, which I find answers my purpose better than the proportions I had been in the habit of using, and I consider this top-dressing answers equally well, whether the crop is intended for hay, soiling, or pasturage; it costs only 31s. per acre; and if we take into account that this application frequently increases the crop to a third more weight, and occasionally, on favourable soils, after a seasonable rain, even more than the half additional has been raised, and that over and above this addition of the finest green food we know, "Nature's Medicine," the crop is some ten days earlier by its application. This is not only of great advantage to the agriculturist in the vicinity of a town, enabling him to commence and also prolong his grass selling season, but is of essential benefit to the stock farmer, who frequently sustains a great loss in the condition of his stock when the turnip crop gets done, and the grass is not sufficiently forward to be available. Whether this top-dressing is given to grass intended for hay, soiling, or pasturage, it should be applied about the first or second week of March; this, however, must be regulated by the weather. As a rule, the sooner it is sown after the 1st of that month the better, provided it be fresh weather and accompanied with showers: it thus prevents the manures from injuring the plants, and secures in the end, and in the fullest manner, all those advantages to be derived from their application. No lumps, either of guano or nitrate, should be sown, as they will burn and destroy the tender plants; both ought to be riddled and rendered as fine as flour; considerable waste, and consequently loss, must take place when this is neglected, which is to be feared is sometimes the case. If the grass is for pasture, I do not think that this top-dressing can be advantageously repeated the same year; but when cut for hay or soiling, the second crop may be started and increased by a second application. Guano alone, in the proportion of 1 or 1½ cwt., may be given, as it is the clover plant principally that the second crop consists of, and which I have found to be greatly influenced and increased by this top-dressing. If the guano is applied in very dry weather, it will be necessary to apply a sufficiency of water to the surface, with a barrel, so as to secure the proper solution of the manure, or dissolve the guano with water and apply it in the same way to the surface every evening after the crop is removed, which I believe is at that season the best and most economical way to apply. Pigeons' dung, in my estimation, ranks next to guano; and when fermented and properly dissolved and prepared, its astonishing effects never fail to appear; the only drawback to its general use is that it cannot be had in sufficient quantity. Soot, I have proved to be an active stimulant: its use, though generally known, is seldom practised; I have frequently used it with signal advantage, and therefore can recommend it as a cheap and effective top-dressing. Superphosphate of lime has considerable claims as a fertilizer, and is, in my opinion, better adapted for a top-dressing than even bones ground fine; it has all the properties of bone dust, and, being far more soluble, gives a food more suited to the growth of the young plants. Dissolved horseflesh is also an excellent top-dressing, and is equally soluble with the superphosphate of lime. Lime on some soils acts very well, but on others its benefits are not so striking; in my opinion, the best time to apply it to the clover plant is when it is harrowed in with the barley and clover seeds in the spring. Salt is frequently applied in small quantity, and its influence is sometimes very considerable. Generally speaking, the beneficial effects derived from the various top-dressings employed depend very much on the time and weather when they are applied, as a want of sufficient attention to these necessary precautions will materially lessen the advantages, even of the best and most approved substances. As to "the proper time to apply them," it may be advised, that the first favourable opportunity after the 1st of March should be taken; and I am sure, if we do not find it convenient to follow the practice of top-dressing all our young grass, every one, I believe, will find it to his advantage to top-dress an acre or two to commence with for cutting, and also a small field for early pasture! In conclusion, I may be permitted to add that a good deal of the success of the farmer depends on the management of his grass lands; how invaluable, then, is the increasing of our clover crop, whether we view it in relation to hay, soiling, or pasture! Hay furnishes us with a food that is both profitable to sell and to consume, and I believe that if we were to allow our fattening cattle a small quantity daily—say 7 lbs. weight—we would find as much benefit arising from its use as 4 lbs. of oilcake. Soiling is a department in agriculture which is daily assuming such an important feature in the agricultural world that it suffers nothing in importance, even when compared with the advantages of the turnip crop; for we frequently find it deserving more attention, especially on the strong and clayey soils of this country, where the turnip culture is attended not only with greater expense, but risk. And when we consider the practicability of the increase of our grass and clover-seeds by top-dressing, we there find a ready means of increasing that description of food which enables us to convert our straw into the most rich and valuable manure, and at the same time to keep our horses and cattle during the summer months in the most comfortable and profitable way.

Mr. Haxton, Drumnod, next read a long and interesting paper. We regret much that, from the length of the present report, and from our reluctance to abridge Mr. M's. very valuable paper, we are obliged to postpone it till our next.

Mr. Melvin, Bonnington, said—Did I think that the directors of the society expected that in taking part in this discussion it was necessary to bring forward the records of minute and carefully conducted experiments, I could not now have engaged in it; but believing that, although these may be very desirable, yet that a statement of one's observation and experience may also be received, it is with this that I now claim your attention. The quantities and proportions of grass and clovers to sow for hay, soiling, and pasture, vary with the situation and condition of the land to be sown, and ought to be considered from two points of view. For hay or soiling, we desire an intermixture of plants which will attain their full development of herbage at one and the same time, so that, when cut, no separate individual may be so prematurely, or allowed to become deteriorated from being too far advanced. In pasture, again, we ought to aim at the reverse of this; the produce of the field is to last for the season, and hence it is desirable to have a succession of plants, the one to succeed as the other begins to fail. The plants generally grown for all of these purposes are fewer that is to be expected, when we consider the rich profusion with which Nature has stocked the old natural pasture of the country, it being a fact that some old turf afford as many as 1000 plants on each superficial foot, and these of many species and varieties, while the ryegrasses and two kinds of clover are those mostly sown. About 40 years ago, a series of interesting experiments were carried out by Mr. Sinclair, at Woburn, on about 100 grasses; but these led to no change in those sown for hay, or one or two years' pasture; and, save the Italian ryegrass, little change has for long taken place. In proportioning the quantities of the grasses and clovers to be sown, it is important to know what number of seeds certain weights of them contain, and after several trials I have found that—

1 lb. weight of red clover of good quality gives, per acre, to each superficial foot	6¼	seeds.
1 lb. do. yellow (Medicago lupulina)	6	,,
1 lb. do. white	16	,,
1 lb. do. ryegrass	5	,,

These vary in different samples, but are what I obtained from several. Neither is it to be expected that all of these vegetate; many do not spring up, others do so and die. It is, therefore, necessary to sow a much larger quantity of each than would be required, even unseen causes not at work creating the diminution. Having found Italian no ways superior in my situation to the common ryegrass, and more expensive, I do not sow it. When the red clover is expected to succeed, the proportion sown is 8 lbs. of it, and 2 lbs. white clover, and 2 lbs. yellow, with one bushel of ryegrass, per imperial acre, for hay or soiling, affording 100 seeds ryegrass, 50 red, 32 white, and 12 yellow, per superficial foot. But where the success of the red is doubted, the quantity sown is reduced to 4 lbs., while 8 lbs. yellow is substituted. Some, no doubt, think this may be a poor change, as they decry the yellow as a weed, and treat it accordingly. Be it so; better, however, to have the land growing weeds which stock consume and thrive on than those that are pernicious. The yellow is an early plant, and comes sooner into flower than the red, and, of course, when allowed to stand before being cut as long as the red, it then becomes wiry, hard, and bitter, and may then, when abundant in the mixture, be rejected by horses. If cut early, it is as readily eaten as the ryegrass, and, for anything known to the contrary, is equally nourishing. Look at a pasture when it has been sown; both sheep, cattle, and horses crop it down, and more especially sheep pick it up in preference to ryegrass, and while abundance of the last named plant may be running to seed, the humble but despised yellow is closely nibbled over. When red invariably succeeds, there is little need to sow it; although, I confess, for soiling it appears to me that its intermixture, by its earliness, added to the bulk of crop and for variety of food, is advantageous. And even when made into hay, although the article brings a somewhat smaller price, yet the additional bulk, and the exclusion of other weeds from the soil, makes up for it. For soiling or hay, the common sorts of ryegrass sown in the district, which, from the manner all varieties are now mixed, it is hardly possible to tell to what kind they belong, seem better suited; but for two years' pasture many plants die out; and, having seen Stichney's variety on the farm of the grower a number of years ago, and since sown it, I find it keeps the land better. In considering the proportions for pasture, it is necessary to bear in mind that, when plants are cropped down, although the period of flowering may be retarded, yet at the season this should take place a greater development of growth occurs, and then we find that in first year's pasture a great difficulty is experienced in keeping down the ryegrass from seeding. When the clovers succeed well, the best way to obviate this is by reducing the proportion of ryegrass and increasing that of the clover. However, as with me a difficulty is felt in securing a root of plants, I never sow less than 1 bushel ryegrass, with 8 lbs. yellow, 4 lbs. red, and 3 lbs. white, per imperial acre, and when there is little chance of the red taking, add other 5 lbs. yellow instead. This seed is cheap, and one can afford to increase the quantity sown. No difficulty is found in securing a braird, provided we sow among winter wheat early in spring, or in spring-sown crops before the drying winds have exhausted the moisture from the surface soil, in which the seeds must be deposited to permit them to germinate. But it is not so easy to retain the clovers after they have brairded. The plants of red may be full and vigorous. In autumn, after the grain crop is removed, they may be all that can be wished until mid-winter; but in spring where are they? It would almost seem that when the plant springs into life it receives the lurking principle of death. The young disease, that must subdue at length, grows with its growth and strengthens with its strength. Of the long list of substances which are now recommended for top-dressing grass, I have tried the sulphates of soda, ammonia, and magnesia, and the nitrates of soda, ammonia, and potash, with gypsum, soot, salt, lime, and guano. With mixtures of these, and without taking up your time in detailing minutely the results of these, I may just say that I have found the nitrate of soda, sulphate of ammonia, and guano as the most profitable, while a mixture of two-thirds guano with one of nitrate of soda is, on the whole, the cheapest and most efficacious. The conclusion arrived at is, that 1 cwt. guano and ½ cwt. nitrate form the best dressing for an acre, that larger quantity makes the grass produced resemble that raised from soot, and that less does not make a proportional improvement. In fields where the plants at spring are thin, the full benefit of the dressing is not realised; sometimes the clovers go out after the application is made. Of none of the foregoing substances can I say that either one or other proved at all efficacious in preserving or retaining the clovers; and I may also add, that when some of these substances were sown with the grain crop, the same effects often followed, the clovers dying out as if nothing had been used. For early soilings, top-dressing with the mixture mentioned seems of much use, and in certain seasons even the whole of the grass intended for hay may be gone over; but in these years when the hay falls below 7d. per stone of 22 lbs., and the dressing continues to cost its usual sum, it appears to me that it will scarcely pay. I have applied most of the forementioned substances to land in pasture in a small way; but, save that the bite sprung up more quickly, I could not say that, throughout the season, a quantity of food was produced sufficient to pay for the increased cost. It seems to me that there is some truth in the statement that plants derive a portion of their nourishment from the air, and that, as they increase the surface spread out, the fresh growth is correspondingly increased. Particular circumstances may make it expedient to top-dress for early grass, such as pasture for milk cows, or for ewes and lambs, when other food becomes scarce; but the same amount of money could be more judiciously applied to the purchase of more bulky and lasting manure than to increase the grass over the usual pasture brake of the farm. The period chosen for applying these top-dressings is about the time when the first fresh tint of green can be seen covering the field in March, or early in April; but much depends on the weather. If sown too early the rains may wash them from the roots, and if delayed too long the plants want the benefit of a first vigorous start. It has long been the custom to cry up the loss which farmers suffer from the neglect of liquid manure, and notable arrays of figures have been brought up to show what could be gained by a more careful application of it. For several years past until this one I have been in the habit of regularly, every other day, carting out the urine from three-fourths of the entire stock in the byres, closes, and stables, and applying it with barrels to the grass lands; of course the chief production of this liquid is during the winter months, beginning in November and continuing to February. I can safely say that the benefit did not do more than pay the cost of the carriage out; it was fresh and unfermented, and might contain about one-fifth rain-water. Whatever I applied from March or during summer always appeared to me to act with more potency; but if we recollect that every 10 tons of the urine in an undiluted state contains 9 of water we will not be surprised at its trifling effects during winter; its effects during the summer may be very different. Another sort of top-dressing I have used is the police manure from the city, consisting of, according to the analysis of Dr. Madden, in the Transactions of the Society for the year 1841,

Water	26·4
Organic matter	13·6
Silica matter	60.0
	100

This spread broad-cast, at the rate of 8 tons per acre, during early winter, afforded little increase of the clover, but the grasses improved by it. This brings me to speak of the effects which all these various substances have on the red clover plant; but first of all I may just state that, so far as my experience has gone, of all the various manures tried, I have been far better paid by purchasing largely of horse, cow, and street manure, than ever I was by any of these light manures, save guano, and next that no description of manure seems effectual in securing a crop of red clover. The whole subject of the clover failure is enveloped in mystery, which science has as yet done nothing to elucidate; and if we take into account the large sums yearly thrown away in seed uselessly sown, and the loss from the want of such a food-producing plant, there is no subject more inviting. Chance and necessity have in our neighbourhood been throwing some light on some of the conditions in which it will grow, and these I will shortly detail. In the year 1845, 16 acres were manured with 8 cwt. guano, sown with turnips; these were all carted off, and the land had 16 tons dung ploughed in spring of 1846 for barley. The clover had hitherto failed in this field; it succeeded admirably in 1847. The same field is again under grass after a similar treatment, and promises well; but this is one instance only; however, the same plan has been followed, and that successfully, for a year longer, by Mr. Hunter, Newliston Haugh; and the finest clover in the district was last year produced on his land so treated. The potato having now become liable to fail where heavily manured, two-thirds are now given in the drill in spring, and one-third on removing the crop before the wheat is sown; the clover, by this treatment, succeeds better. Beans also seem to have the power of restoring to the land its power to grow clover. In 1844, the centre portion of a 20 acre field having lost its clover plants entirely, was ploughed up, dunged with 16 tons farm-yard dung per acre in drills, and sown with beans: the sides which had no clover were made hay, cut early, and twice ploughed, well harrowed, and dunged with 16 tons dung, and the whole sown with wheat on the removal of the beans. Fallow followed—it had 17 tons dung applied per acre for wheat, which was good, and the whole was sown with a fair mixture of red and white clover; the centre part, that was beans, carried a large and bulky crop of red clover, and hardly a plant was seen on the sides; the ridges in fallowing had been a little changed, and the last drill of the bean land on either side showed the clover as cut off with a knife. The fallowing of land regularly is said to promote the growth of red clover; this has not happened with me on a field fallowed in 1840, '44, and '48; a portion was dunged in 1848 with 17 tons per acre of cow, another with a like weight of farm-yard, and a third with a like quantity of Edinburgh street dung, and sown with 8 lbs. red, 3 white, and 4 yellow clover in spring of '49. When the crop of wheat was cut, the clover had risen up amongst it on all the portions, and was strong until mid winter; but when the hay came to be cut, no red clover was found in it; all had gone. Neither kind of dung having evidently the power to retain it, in this case the seed could not be blamed, as it was successful in another field. So far as it yet appears, no one of the hitherto assigned reasons meets the difficulty. One tells us that the food of the clover becomes exhausted, and hence it fails; but the bean belongs to the same class of plants, and the turnip thrives well in the same rotation. Some say it is from the want of potash or other saline matter. Dr. Anderson, in the January No. for 1850 of the Transactions, instances pit ashes near Newcastle as being wonderfully efficacious. Now the ashes of the Edinburgh coal, from the analysis of Professor Johnston, contain somewhat similar substances; and at best, the street manure is not very favourable to the growth of clover, many farmers on the line of the canal having ascribed the scarcity of clover in their fields to its use. Now, it so happens that this opinion, that ashes are beneficial to clovers, seems to have a wide circulation; for in "Morton's Cyclopedia," in the article Coal Ashes, it is there stated "that in all cases where coal ashes have been used extensively they have been uniformly found to encourage the growth of the leguminous crops—clover, lucerne, peas, beans, and sainfoin." Now, there cannot be a better ascertained fact than this, that if beans are manured with street manure the crop is certain to fail. Insects have been blamed for causing the failure; reasoning from analogy, is it not far more likely that they would be more destructive in the infancy of the plant, than when it has existed and thriven during 8 or 10 months? Professor Henslow ascribed the failure to its being sown along with barley, and asks farmers to leave part of a ridge unsown to ascertain this. We have seen before that it is often not till many months after the barley or wheat crop has been removed, that the plants die out; these are some of the chief reasons assigned, and it would appear that we are quite at sea on the subject. Whether the cause is not to be sought for in the physical condition of the soil, and the form in which the manure is presented to the plant, I will not venture to assert; but in the good time that's coming, when the chemist or physiologist condescends to know more of the practice, and the practical man knows more of the science—when practical men are brought to believe, that although no striking discoveries are being made, the man of science is preparing a power, it may be slowly, it may be imperceptibly, which from small beginnings (like Volta's pile, resulting in the annihilation of space by the electric telegraph), shall shed a light on the mysterious process of nutrition, and, like the rising sun, shall dispel the mists of ignorance and prejudice which darken its course.

Dr. Anderson said that as they had already exceeded the time usually devoted to these meetings, he should restrict himself to a very few observations. There was, in fact, only one part of the subject on which he could venture any remarks, and that was the nature of the substances to be employed as top-dressing. He had been particularly interested by observing that all the gentlemen had concurred in considering three substances as greatly superior to all the others, and these were sulphate of ammonia, nitrate of soda, and guano; and Mr. Scott had even stated the quantities in which he had found these substances to produce equal effects. Now it appeared that the amount of ammonia which the quantities recommended by Mr. Scott would yield, supposing the whole of the nitrogen to pass into that state, would be in the case of sulphate of ammonia about 32 lbs., nitrate of soda 28 lbs., and Peruvian guano about 30 lbs.; so that the quantities which enlightened experience had shown to produce the same effects were as nearly as possible those which we should be induced to recommend on theoretical grounds. There were, however, various other matters of much interest which had been touched upon, and which might form subjects for most interesting and important experiments: he alluded to the applicability of certain manures to particular plants. One of the speakers had stated, as the result of his experience, that nitrate of soda was most beneficial to ryegrass, and sulphate of ammonia to clover; a statement which he considered to be deserving of much attention, and one on which further experiments would be most desirable. Mr. Melvin had particularly referred to the subject of the clover failure, which he agreed with him in thinking was still involved in mystery. He had, however, come to the conclusion that it was not dependent on chemical causes, as he had found from a considerable number of analyses, some published and some unpublished, that no differences could be detected in the composition of soils on which clover failed or succeeded. Mr. Melvin had also referred to the successful result of the application of pit ashes near Newcastle, which had been analyzed in the laboratory, and had compared them to coal ashes. We must, however, so far correct Mr. Melvin as to state that only a comparatively small quantity of that substance consisted of coal ashes; its principal constituents being the ash of the bituminous and other shales which are brought up along with the coal, and are burnt at the pit mouth. That substance was remarkable for the large amount of sulphate of lime it contained; and in one other case on Mr. Scott's farm, the success of the clover had been also traced to a sort of shale, which contained a considerable quantity of sulphate of lime. He believed, indeed, that the most positive facts we possessed brought us back to the old opinion first expressed by Sir Humphrey Davy, of the importance of gypsum to the clover crop; but even that would not, except in a few cases, explain the causes of its failure.

The Chairman said—As the Secretary has intimated that the business is now exhausted, and as the present concludes these interesting meetings for the season, I cannot refrain from directing attention to the very high character which these discussions have maintained. Dr. Anderson has referred to the impossibility of arriving at a satisfactory conclusion on some of the points discussed in the reports read to-day. There is, however, one conclusion, the propriety of which no one will dispute, and that is that we are under a deep debt of gratitude to the gentlemen who have so readily rendered their assistance on this occasion. Our unqualified thanks are certainly due to them for the very satisfactory manner in which one and all have discharged their duties; they have given (and in this consisted their very high value) not so much opinions, as the results of their own experience and practice; and the importance of the information is the more valuable from its variety, embracing the practice, not of one county, but of many; and thus, as one of the speakers judiciously remarked, preventing those mistakes which a more limited information might produce. In this way, their respective practices are explained and compared. It is also valuable in inducing parties to consider the principles on which the practices rest. We are cheered by the great interest shown by the gentlemen who have spoken on the various occasions, many of them coming from a distance, and all of them most handsomely and liberally rendering their assistance. The character of the communications has been very high; and comparing them with the numerous essays sent in, some years ago, for competition for the large premiums of the society, I consider them not only equal, but infinitely superior; which certainly makes us doubly indebted to these gentlemen. The discussions, I trust, will be read far and wide, and will prove not only valuable in themselves, but also as affording an example to provincial Agricultural Societies, and induce the intelligent farmers of every district to meet for the purpose of communicating the results of their practice. I was much struck with the frequent references to chemical principles introduced by the different speakers; and I think the Highland Society may partly take credit for this through the appointment of Dr. Anderson. The importance of a knowledge of these principles in guiding and assisting the practice of farmers can scarcely be over-estimated. I have nothing farther to add, except to express how strongly I feel we are indebted in connection with these meetings to my friend the Secretary, on whom the success of them so greatly depends. He must be well acquainted with the intelligent agriculturists throughout the country, and must have had very great labour in bringing the meetings to such a satisfactory conclusion. I am only sorry that this is to be the last meeting for the season; but the complete success with which they have been attended will prove not only a reward for past exertion, but an encouragement for prolonging the arrangements in a future year. I beg to express the gratification I have felt in attending the meeting to-day, and also the honour which I feel in the Directors appointing me one of the deputy chairmen of these meetings.

Mr. WATSON, Keillor, proposed a vote of thanks to Mr. Milne for his able discharge of the duties of Chairman, which was cordially agreed to.

FOULNESS OF LAND.—ITS CAUSE,

What can be the cause that the land is so foul? is a question often asked, and sometimes it admits of a ready answer, and sometimes it does not. The instances of the first cause are obvious. Either the land has not been properly cleared for the fallow or root crop—or there has been a failing crop of turnips or clover—or attention has not been paid to hand-picking when the barley has been sown—or the seeds of some vile plant have been allowed to be shed in some unfortunate year, and so a large crop of weeds has resulted.

Perhaps the most pestilent of all root-weeds is the couch, and of all annual weeds is the spurry—they both affect arable land, and are the most obstinate to eradicate of perhaps all other kinds. The dock and the thistle are bad enough, but they admit of simple extraction from the ground by the hand or forceps; but neither hand nor horse hoeing, neither rake nor grubber, will altogether overcome those pestilent intruders, when they have fairly taken possession of the soil—we mean the couch and the spurry.

They have both their peculiarities. The couch is a root-weed, having a blade not unlike the wheat, and the root is a long running linear string, having at every inch a net-work of small filaments; and so wonderful are the vital powers of the plant, that a single joint, aye, even if half dried, will so increase as to form a parent plant—the spawn and nucleus of a breed still more potent. But its reproductive powers do not cease here. Its stem grows with great rapidity—it forms an extemporaneous kind of flower, it soon matures its seed, and again we have its gossamer and insidious little seeds in our corn, and in our artificial grass seeds, and so lay the foundation of a subsequent crop. And such a crop! It is not here and there a filament, a rootlet, or a blade; but the whole body of a light soil becomes a sponge of roots, ramified in every possible shape and direction, until the plant intended to be cultivated is eaten out, and banished from the soil.

And what the couch does in the soil the spurry does above it. There are few plants which will thrive on a blowing sand; but it seems as if a law were in existence for providing life for every state of climate, soil, and situation; and hence the spurry which in May presents but a needle of vegetation, without leaves or branches, and almost invisible, spreads out of every joint fifty more similar needles, until every point spreads out east and west, and north and south, like so many mouths, seize the truant gases, the needful moisture, or the vital air; and many a promising crop of barley is eaten out in a month by the pre-occupancy of the surface of the soil by this pest, provincially called by the vulgar but expressive name of "lousy grass." Nor is it backward in leaving a progeny: the flower hastens as rapidly as the leaves, the seed as the flower, and we have seen the ground covered black in harvest with the shed seed of this plague of the farmer.

"But my soil is natural to quicks"—in other words there is something in some soils so genial to couch, that it seems to grow spontaneously. How is this? Here is a soil rich and fertile—rather light than otherwise, but tenacious enough for all kinds of corn crops, and with no great care of husbandry the occupier never grows more couch than a few labourers can carry away in a basket. But here is another farmer, occupying a grey sand, good for turnips and barley, and which now will produce wheat. He has at the end of the four course left a complete forest of couch. Does not the one soil grow them natural? Both are equally clean at the beginning; both have the same management, but the one is a model of cleanness, and the other is a mass of couch-like wind-rows. The secret is here. No plant can grow without a parent, whether it be a lichen on the wall, or an oak of the forest—but a wall is much more genial to the one, and a deep solid soil for the other: and so the couch will live, and thrive, and obtain dominion in one soil, and almost disappear from another.

The couch sod requires a large supply of oxygen. Hence all open porous soils afford it the means of rapid and vigorous development, and this tells not only in the spread of the ramifications of rootlets in a complete net work, but it also accelerates the development of the seed, so that at harvest time a considerable portion of it falls upon the ground. It ripens before the corn—it sheds its seeds, which are two or three years before they appear large tangible plants; but in four years they, aided by the genial soil, help to form the net-work of which we have been speaking.

Green crops, from their nature, their treatment, their habits, tend more than anything else to keep down both couch and spurry. Corn crops are just the reverse—they are favourable to the existence and the supremacy of both; but as corn must be grown—as it forms one-half of the produce of the alternate system of husbandry, and can hardly be given up in the course with much prospect of profit—we do not see how the evil can be palliated. If it be worth eradication it must be done by changing the character of the soil's tenacity. The land must be marled, or clayed, so that there may be less stimulus of oxygen to the roots of the plants, and thus the couch and the spurry may both be kept in their proper region, and under proper subjection, and still corn be grown in its course.—Gardeners' and Farmers' Journal.

FARMING PROSPECTS.

The cry for protection to native industry which is now being so loudly raised, has doubtless its origin with a body of men who are not used to cry out so loudly unless there is a just and sufficient reason for so doing; but whether or not the appeal will be responded to, at least at present, remains a mystery. This is certain, that the agriculturists will be unable to continue much longer struggling with the present state of things; and, unless there be some material alteration, and that soon, the consequences must be very severe.

It is not merely an adjustment between the landlord and tenant, as is often argued, that can enable the occupier of land to farm to advantage under the *regime* of free trade; the tithes are the same, or nearly, the taxes are the same, the income tax is levied on the poor tenant who may be unfortunate enough to farm land for which he pays a rent of £150 a-year, and whether he be gaining or losing £100 or £150 a-year is of no consequence, he still has the odious tax to pay, and instead of being remunerated for his skill, industry, and outlay of capital, he has actually to pay 3½d. in the pound on his rental, for the privilege of losing money.

As has been stated before, it is not merely a question of rent, and if we come to look into and examine it we shall find such to be the case. On land for which the tenant pays 20s. per acre, the average of a crop of wheat may be said to be 20 bushels per acre, which at 7s. 6d. per bushel amounts to £7 10s. per acre; but wheat is only selling now for from 4s. 6d. to 5s. per bushel, making a difference of from 2s. 6d. to 3s. per bushel, calling it 2s. 6d., we shall find that in the single crop we have mentioned a loss of 2½ years rental. Then take the crop of oats, which on land such as lets for the sum before named, and which will average from four to five quarters per acre, we find that instead of selling for from £1 to £1 1s. per quarter, they are at from 14s. to 15s., thus making a difference in the value of this crop equivalent to nearly the rent of the land for a year and a-half. The next succeeding to the oat crop is a bare fallow, which just costs the same working as before, or very nearly, the artificial manures employed are the same in price, the poor rates are the same, or if any change is made in them it is to make them more than before, the church rates, the taxes of all kinds continue as before, and in fact there is no one thing which the agriculturist has to purchase, and which could benefit him to any extent, but is maintaining the same prices as before.

When those things are taken into consideration and duly weighed over, the conclusion to be arrived at is that the farmers must have been making enormous profits before the introduction of the free trade measure, or they are now losing money to a very great extent. Those are the only two conclusions to be arrived at.

If farming was scarcely remunerative in the time when protection enabled them to compete with the foreigner, who has neither the rates and taxes to pay which an English farmer has, and whose labourers are content to live on stale bread and still sourer milk, with an occasional glimpse of a herring or a piece of mouldy cheese; and who can reside in a cabin the walls of which are composed of turf, and who considers himself rewarded for a hard day's labour with the sum of 6d., at most 8d., out of which he has to provide for himself and his family: it is an impossibility for him to compete with the foreigner now, when every article which he has to purchase continues to be the same price as before.

Necessity is said to be the mother of invention, and doubtless the effect of free trade has been to make the farmers try every means in their power in order to meet the circumstances which free trade has given birth to. Had they not been so hard pressed, ten to one the most recent improvements in agriculture would have been made. The science of chemistry, a knowledge of which is so essentially requisite to the cultivator of the soil, in order to know the component parts of the land he occupies, and what would be the best appliances in order to make such soil bring forth the greatest quantity of matter at the least possible cost, would not have perhaps been so much sought into and understood, the experiments as to the effects produced under different modes of draining, of ploughing, of working the land in general, the effects of thick and thin sowing would not have been so carefully conducted and noted, and all the experiments which are made on a well conducted farm made with so much accuracy. But we must consider that all this has been attained at a great cost to the suffering parties, and although farming is in a higher state of perfection than it was when the individuals in power turned traitors to the cause they professed to support, yet we must remember that such perfection has been arrived at by means of which nearly one-half of the farming population of this country has been reduced to beggary and ruin; it is something like an experiment said to have been made regarding the quantity of food sufficient for a horse to subsist upon, which was made less and less every day, until it was reduced to a bean a day, when the animal *unfortunately* died.

It will be well, if at the last, free trade be found to come up to the expectations of its promoters, that they find their wishes realised, and the nation at large benefited by their darling scheme. There is evidently a change come over the spirit of their dream, and many who were at one time its most ardent promoters are now beginning to cry for protection to native industry.

April, 1851. HORDEUM.

LONDON FARMER'S CLUB.

TO WHAT EXTENT THE CULTIVATION OF LAND IN ENGLAND AND SCOTLAND IS AFFECTED BY SOIL, CLIMATE, AND OTHER CIRCUMSTANCES.

The usual monthly meeting of the Club took place on Monday, April 7, at the Club-rooms, Blackfriars, Mr. W. F. Hobbs in the chair. The question for discussion was thus set down in the card:—" To what extent the cultivation of land in England and Scotland is affected by soil, climate, and other circumstances." It was introduced by Mr. R. Baker, of Writtle.

The CHAIRMAN said, I have been very unexpectedly called upon to fill the chair on the present occasion; but I do so without hesitation, because I consider that so long as I am a member of this club it is my duty to comply with the request of the committee in anything which may tend to the club's advantage (Hear, hear). I am sorry that I cannot congratulate you on the prospects of agriculture at the present time. I fear that there is nothing which can be regarded as much more favourable than the state of things when we last met, though there certainly is some glimmering light in the horizon (Hear, hear) which may ultimately turn out to our advantage. I must say that I feel that this club has done its duty as regards the practical and scientific points of agriculture, that in that respect it has done all in its power to advance our interest. The subject which we are met to discuss this evening is one which I consider of great importance. I am happy to say that we have not only an able but an old and sincere friend to bring it forward, and I have no doubt that he will do justice to it (cheers). Every one who is acquainted with agriculture must know that climate has a very great influence upon the cultivation of the soil. Those who have travelled in various parts of this great empire are aware that certain productions may be more advantageously cultivated in some districts than in others. We find that in the north of England and in Scotland turnips and oats, and other things of that kind, can be produced to much greater advantage than they can in the south of England; whilst in the eastern and southern counties corn, and wheat in particular, can be grown much easier than in the north (Hear, hear). I will not enter into the subject at any length; I will only say that a perusal of the able essay on the influence of climate upon cultivation, which appeared in the Journal of the Royal Agricultural Society a short time since, must convince every one that, on account of our insular position the southern part of this kingdom must depend very much upon the effect of climate as regards the productions which are brought to market. Mr. Baker will, I have no doubt, elucidate that point, and show that Great Britain cannot at all times produce corn with the same facility that it can be produced on the continent and in various parts of the world.

Mr. BAKER said, The question which is set down for discussion relates more particularly to the difference of soil, climate, and other circumstances, between this part of the kingdom and Scotland. As it is put down here (referring to the card) the question is, "To what extent he cultivation of the soil in England and Scotland is affected by soil, climate, and other circumstances." In approaching this question let me remind you that at our late annual meeting a subject was brought forward by Mr. Pusey which involved this very question; a challenge had been given by him with the view of testing the comparative merits of the cultivation of Scotland and this country. That challenge had not been accepted by the Scotch cultivators; and some allusion was made by Mr. Pusey to that fact. An interchange of opinions took place between that gentleman and the Addington Club, and it appears that the challenge is declined. I quite concur in the propriety of that decision; for, in the case of two countries so differently situated as Scotland and England, presenting such a diversity of soil and climate, I hardly see how any one district could be fairly brought into competition with another (Hear, hear). All that you can do in such a case is to take into account differences of soil and climate, and other accessories of cultivation, and then judge how far what is applicable in one country is applicable in the other. The difference which exists between English and Scotch cultivation appears to me little or nothing. We have men of energy here, and I am quite sure that there are men of as great enterprise engaged in agriculture as are to be found in any other occupation (Hear, hear). That there are men of enterprise in Scotland is undeniable (Hear, hear). There are in that country men of the most astonishing energy; and they have too, it is stated, a worse climate and soil to deal with than those which prevail in this part of the kingdom. The immediate object of this evening's discussion is to ascertain what is the agricultural position of this country in relation to Scotland, and to see how far what is applicable in that country may be made applicable here. The subject cannot be treated upon isolated points; it must be dealt with upon broad principles, and we must inquire generally into the state of the climate and soil, and determine, if we can, how far any similarity exists in those respects. Good and bad cultivation are doubtless to be found in both countries. We know that there is in general in this part of the kingdom good cultivation; I contend that bad cultivation is now the exception (cheers and dissent). The cultivation of this part of the kingdom has within my recollection so much improved, that it is now very difficult to find a farm that is badly cultivated. Of course some farms are better cultivated than others; but whereas thirty years ago it would have been difficult to find a farm that was well cultivated, it would now be equally difficult to find one that was badly cultivated (cries of "Hear, hear," and "No, no"). I know there are some gentlemen—I believe their number is small—who differ with me on this point. Having farmed more or less, in the county in which I reside, for forty years, I have had many opportunities of making a direct survey of all the land, field by field, for twenty-five miles in one direction, and upwards of twenty in another. I have on many occasions been over the land for different purposes; and I state, without fear of contradiction, that within the period I have mentioned the general cultivation of the county of Essex has materially improved, and that it is still improving. There is an opinion existing to the effect that the difference of latitude between the southern districts of England and the southern districts of Scotland is such as to render what is applicable in the one country just the reverse in the other. Now, upon investigation, I find that that does apply to a certain portion of Scotland and to a certain portion of England; and if this discussion had turned upon a comparison between the eastern counties of England and the eastern counties of Scotland, and the counties on the western coast of Scotland and on the western coast of England, we should have had an inquiry more deserving of our attention than the present one. But I think that on this occasion we may be allowed to diverge a little; and in alluding to the difference of climate between the eastern and western districts of this part of the kingdom, and shewing that the same difference prevails in Scotland, I think I shall be pursuing the most useful course. The climate of this country is affected more perhaps than that of any other country by contiguity to the sea. The temperature of the water is always so far above that of the air, as to have a beneficial effect upon cultivation in that part of the kingdom which is situated near the sea, more especially that which lies on the western coast. At the present moment, if a thermometer were placed in the water about a league from the Land's End, the temperature would be found to average from 51 to 52 degrees; whilst on the eastern side it is now several degrees lower. Taking Colchester as one point, and Exeter as another, it is found that in the months of December, January, and February the temperature is from 4 to 5, and in some cases 6 degrees lower in the former than in the latter—a difference which of course has a very great effect upon vegetation. The high temperature of the water in the south and south-west also causes much greater evaporation than is found on the eastern side of the coast; and with the south westerly winds there is a much greater quantity of moisture than on the opposite side of the country. The south-westerly winds bring the warm air, which, being arrested in the mountainous districts of Wales, and in the mountains and highlands of Scotland, the result is the fall of a large quantity of rain. The proportion of wet days is two out of three, while we have only one in three. The fall of rain is nearly double what it is in many parts on the eastern side. This of course has a very material effect upon agricultural productions. Hence, on the western side the land is chiefly used for the production of grass and root crops; while on the eastern side, where the air is much drier, and the temperature lower, the land is best adapted for corn crops. But although the temperature on the western side is higher than that on the eastern in the winter, in the summer it is frequently not so high. It is 3 or 4 degrees higher at Colchester in the summer months than it is on the west during the same period; consequently we have the benefit of heat when it is required for the grain crops, while we cannot produce green crops in the same abundance that they are produced in the west. If the attempt is made on the eastern side to produce Swedish turnips, and if they are sown there as they are in Ireland (in May), we are almost certain to lose our crops, because the alternations are quicker and of longer duration than they are in the west. Our early turnips rarely escape mildew, which is in many cases so injurious as nearly to destroy the crop; while the inhabitants of the western side are almost strangers to that evil. It must be obvious to every one, that where the air is always moist, there turnips can be grown to most advantage; and, on the other hand, that where the air is warmer in summer, and where the least rain falls in the summer months, the land is most adapted to the production of grain crops: hence Suffolk, Norfolk, Essex, and Kent are notorious for grain crops, and Devonshire, Wiltshire, and other counties in the west, for green crops. Now, in drawing a comparison between this country and Scotland, we must proceed upon the principle which I have already stated. About the centre of Scotland, there is a large mountainous district extending to the west: in that district a much larger quantity of rain falls than in England; for although on general principles we may say that a larger quantity of rain falls on the western than on the eastern side of the kingdom, still, from accountable causes, which it is not worth while for us to explain, much larger quantities fall in one locality than in another within a few miles of it. In one part of Cumberland, I think, the enormous quantity of 112 inches of rain falls within the year; whereas, in another place, only 30 or 40 miles distant from the first, the fall is only 36 or 37 inches; and in other parts of the country there is a similar discrepancy. This arises partly from the attraction of mountains, partly from the direction of rivers. It is notorious in the neighbourhood in which I live, that we very seldom have a thunder-storm. When thunder-storms occur in that part of the country they pass off to the south, towards the hills of Kent. During the last twenty years I have used a great deal of glass in my gardens, and I do not know that I have had a single pane of glass broken by a hailstorm during the whole period. I have thus explained to a certain extent the effect of a climate upon cultivation. The geological character of these two portions of the kingdom are widely different. In Scotland we have the oldest formations, whilst in the English counties we have those of a more recent character; none of them, in point of age, exceeding those found in the tertiary series. The consequence is that we have soils entirely of different character to compare: one district having the advantage of coal in abundance, and the other having none, unless sea-borne or conveyed by railway carriage. As a consequence, the soil must vary to a considerable extent in either kingdom, and that within short distances; but we find that those greatly prevailing in Scotland will—taking the district from Berwick to Alnwick—be on rocks of limestone; Haddington and Selkirkshire, freestone; Peebleshire, clay slate, intersecting and resting upon limestone, with all the various degrees of upper soil found between tenacious clay and loam, with all the other varieties of a siliceous character prevailing and alternating according to circumstances. In England we shall find that the greater part of Cambridgeshire, and portions of Essex, Suffolk, Kent, Sussex, and Hants, rest upon chalk, alternating with considerable districts of London and Wealden clay, and more especially chalk, clay and marl, with beds of gravel, sand, diluvial and alluvial formations; both portions of the kingdom having excellent roads, and reached by numerous inlets from the sea, and by the sea itself. It will be seen that all these descriptions of soil are peculiarly adapted to the production of grain, vegetables, and artificial grasses; and, by the intermixture and judicious application of one description of soil to the other, they become and act as inorganic manures to each other, giving full scope to the ingenuity, skill, and industry of the cultivator, and enabling him to derive the most beneficial results by his intelligence and application. In both cases we will, for the sake of simplifying this investigation, consider that the advantages are, upon the whole, equal. It is to climate more particularly, and to difference of laws and customs prevailing, over which the agriculturist has no control, that we must attribute any general difference that exists—the enterprise, the talent, and the ability, being also equal; for, although more is attributed to our Scottish friends, it arises mainly with those whose places of nativity lie further northward, and who, in proportion as they become further removed from the more temperate districts to the elevated and colder ones—from infancy exposed to greater privation and untoward climate—are taught to wrestle with the elements more continuously than those more fortunately situated, and thence derive habits of perseverance and industry beyond their competitors. It is upon the temperature of various countries that the successful cultivation of land mainly depends. But difference of temperature is dependent upon other causes than upon parallel distances from the equator; Humboldt having, from long investigation, defined the various points at which the same temperature is found to prevail. If from point to point so defined a line should be drawn, it would be denominated an isothermal line, as the places defined on the surface of the globe would under it have an equal or average amount of temperature throughout the year: thus the isothermal line corresponding to the temperature of 32 degrees of Fahrenheit, or perpetual snow, passes between Ulea, in Lapland (lat. 66 degrees) and Table Bay, on the coast of Labrador (lat. 54 degrees), being a difference of 12 degrees latitude between the two places. So the isothermal line of 41 degrees of temperature passes near

		Lat.		
41°	Stockholm	59½°	St. George's, Newf.	48°
50	Netherlands	51	Boston, U.S.......	42½
59	Rome and Florence	43	Raleigh, N. Carolina	36
48	Edinburgh	39½ 37½	Kusan, Russia	39½

In this case, although of the same latitude, the main difference of temperature is upwards of 10 degrees. The latitudes of places having the same winter temperature sometimes differ as much as 20 degrees. The winter of Scotland is as mild as that of Milan. The mean temperature at Edinburgh is about 38½ degrees; at Kusan, under the same latitude, only 2 degrees; and the winters of Pekin are as rigorous as those of Stockholm. The climate of England and Scotland is influenced greater than that of any other European country, from its being entirely surrounded by the sea. In conjunction with Ireland, the British Islands are the most western portion of Europe; and the gulf-stream of the Atlantic flowing direct from the Gulf of Mexico, situated within 15 degrees of the equator, in the direction of Ireland, the sea-breezes will necessarily be of higher temperature than from those flowing in an opposite direction; the ice of the Baltic Sea, and the low temperature of the northern part of Europe, coming directly into opposition with the gulf-stream before adverted to, and which flows from the Gulf of Mexico, doubles Cape Florida, and flows parallel with the North American shore nearly as far as Baltimore, where it flows directly eastward between 34 and 45 N. lat. to about 36 W. long., and thence turns southward by the Azores, and unites with the North-African or Guinea current, which flows parallel with the western coast of Africa, and joins a portion of the gulf-stream opposite the Bay of Biscay; from that Bay a similar current, called Rennell's current, sets in, and passes opposite Brest on the French coast, and then flows westward to the southern extremity of Ireland, where it parts—one portion flowing up the Irish Channel, and the other diverges to the north-west of Ireland; whereby the water is most attenuated opposite Cornwall round to the Bristol Channel, and more especially on the south of Ireland. This stream is met by the water flowing in an opposite direction about midway, or nearly parallel with the city of Dublin, and therefore the coast of Scotland is not approached by it; but when the south-westerly winds prevail, the whole of the southern portion of the kingdom, from the Tweed, has its atmosphere greatly elevated in temperature by it; and when a southerly wind prevails, then the whole of the United Kingdom partakes of its beneficial influence. The heat of the sea-water under the influence of the sun in the creeks and bays of the Atlantic, from 20 degrees S. latitude to 20 degrees N. latitude, is given out to the atmosphere as it is carried along towards Europe, and, as the wind prevails generally from the S.W. during the winter and spring months, they bring with it the mild and moist temperature so peculiar to this country; the temperature of the water, from the autumnal to the winter Equinox, being at from 50 to 51½ degrees. The water returns by an under-current from the high northern latitudes; so that, independent of the tides, the water upon the surface is generally flowing in one direction, and the water below returning in a contrary one, exactly as is found in the pipes applied for the heating hothouses; and thus the temperature is equalized in most parts of the globe, it being only at those places furthest distant from the sea and most inland — as Moscow, Warsaw, and places similarly situated—that the rigour of winter is experienced. The quantity of moisture that enters into admixture with the air depends also upon the temperature, and consequently the rain that falls in any particular locality for a series of years will be nearly the same, and will therefore enable us to judge with tolerable accuracy how far one district is more than another suitable to the production of any particular plant or vegetable; and having ascertained this, we shall then be further able to judge how far we can assist, by cultivation or other means, the productive quality or disposition of the soil, in the production of such particular plants or vegetables, either by rendering soils more retentive of moisture in the summer months, or by draining carry off the superfluous moisture in the winter months, as well as to correct any want or excess of moisture of the atmosphere itself. But as the diversity of soil and climate varies so much within a short distance, it would be impossible to deduce any satisfactory conclusions upon the subject individually, therefore it will be only upon general principles that we can pursue the investigation. The altitude of places above the sea has a very material influence upon climate, a few feet in point of elevation being equivalent to many miles in latitude. Indeed it was a subject of such close investigation by Baron Humboldt, that he found that the same laws that governed the production of plants from the equator to the poles were applicable in the ascent of mountains, the tropical plants growing in the valley below disappearing as he ascended, until by degrees he arrived at all those in succession as would have been found had he proceeded from south to north, until the coniferæ or fir tribe alone could be found, verging upon the line of habitual snow and absence of vegetation. Plants of every description have their places of natural production, and it is with the utmost difficulty that the plants found under one degree of latitude can be brought to flourish under another. The Indian corn or maize and the vine will both succeed in about the same degree of temperature. Wheat will grow and succeed well upon a larger extent of surface than almost any other plant or vegetable, and thus becomes a plant of more universal cultivation than any other, and has thus become indispensable to the sustenance of man; but requires a certain degree of heat to ripen to perfection, which is more important than a high mean temperature for the whole year. The same, to a certain extent, applies to both barley and oats, but the latter will succeed at a far more northerly point than the other two. The quantity of moisture brought by the winds from the Atlantic, where the surface of the water is found at a temperature of 51 deg. in winter, becomes arrested by the mountains of Scotland and Wales, and consequently the amount of rain falling upon the eastern side of the kingdom is much less than that falling upon the western, where, in addition to the quantity of rain, the atmosphere is charged with greater moisture than the opposite coast. It is on this account that the whole of the western counties of both England and Scotland produce grass and vegetables in greater abundance than the eastern counties. In Essex, Suffolk, and Norfolk, less rain falls than in any other counties. The air too is more deficient of moisture, and consequently all grain crops succeed well or better than in other counties. The eastern part of Scotland differs but little in this respect, and, with the exception of a less average amount of heat, is scarcely inferior; and, as the difference of summer heat is not more than one degree to every one hundred miles, it is consequently to that extent deficient; but, on the other hand, this is partly compensated by the extreme mildness of its winters, and having more snow for the protection of its crops. On the other hand, it is far better adapted for the production of root crops, which, with the exception of mangold wurzel, all grow better in Scotland than in England, the long-continued drought of the autumn and early summer months producing mildew in England, which is unknown in Scotland, so as frequently to destroy the whole of the crops of early swedes. It is from this circumstance that the growth of the common white turnips is kept up, especially in Norfolk, the lateness of the season at which it can be sown to a great extent superseding the hazard attendant upon the growth of swede turnips. Temperature in this kingdom is more affected in the winter than in the summer, and differs more from west to east than from north to south. Thus between Colchester, in Essex, and Exeter we find the mean temperature of the summer to be about the same; but in winter, that is in January and December, it is four degrees colder at Colchester than at Exeter; but in the autumn months it is five degrees colder at Exeter than at Colchester. Of all things heat is most essential to the growth of plants, and when combined with light and air, the three principal essentials are supplied : cultivation steps in and does the rest. From the alternations of rain and drought being less frequent in Scotland than in England, Scotland is better adapted for the production and growth of crops than England ; but from the temperature of the latter being higher they ripen more regularly, and, upon an average, are from three weeks to a month earlier, which has a decided influence upon the quality. The difference of climate is, however, not sufficient, in ordinary seasons, to produce any greatly different results in both countries, but in cold and backward seasons the difference then becomes very apparent ; and this difference has been so great that, upon a farm in occupation harvest has been completed by the 25th July, when in other seasons it has not been commenced before the 25th August. These are extreme cases, it is true, but the average seasons of commencement range between the 25th July and the 1st of August. Soil has a material influence upon the early ripening of the grain crops. It is usual for the labourer to proceed from the northern to the southern portion of Essex to assist in the harvest, the time of commencement in the two districts being fourteen to twenty-one days earlier in one district than in the other. From the circumstance of coal being found plentifully in Scotland, and the district being thinly populated, steam power is generally adopted, thereby diminishing the cost of production materially ; for, as taxation enters largely into the cost of human labour, it is superseded by use of machinery, and the number of labourers being less to the square mile, it is very rarely that a surplus is found ; whilst in the southern counties the labourers are all paid in money, and the parish charges, by way of rates for the poor, is already so heavy, that it almost precludes the adoption of steam power, inasmuch as the labourer must be maintained indirectly, if steam power becomes established extensively. The cost for manual labour to arable land in England is found to be 30s. per acre, and the cost of horse keep 20s. This is upon the reduced prices of produce, the maintenance of the horses being at the rate of 7s. 8d. per week, and the labourers 8s. per week. This cost is equal to two-fifths of the value of the crops when produced, and is the only portion of the cost of cultivation that has been reduced in accordance with the depressed prices of produce. From the other three-fifths the rent (one-fifth), the tithe, seed-corn, rates, taxes (one-fifth), and the tenant's profits and interest (one-fifth), ought to be derived ; but, in consequence of the rent, tithe, rates, and taxes not being reduced, the whole of the latter, viz., the tenant's profit and capital, are swept away, and it will afford me infinite pleasure if any of our northern friends can shew us that they are in a better position. If they can show a profit at the same time that we exhibit a loss, I think we ought to concede to them that, whether they are the best cultivators or not, they are undoubtedly the most fortunate ones. To those unacquainted with the nature of soils as exhibited over the surface of these kingdoms, it would strike them with astonishment could they witness the result of the produce arising from farms apparently about equal in quality. It is not an unusual thing to find a few acres upon every farm that will yield upon an average from six to eight bushels per acre of wheat more than any of the adjoining fields, however well farmed. The calcareous clay, chalk, and marled soils are all productive of wheat, and with proper farming and an adequate supply of manure will continue to grow excellent crops of wheat and barley for a series of years together. Upon land devoid of carbonate of lime, and which consists principally of strong clay, little progress in amount of production will be made until those necessary adjuncts are supplied. It is very true that crops apparently abundant may be obtained, but in which the yield will be found deficient. It is upon these grounds that the comparative quality of farming cannot be ascertained unless upon soil of the same quality in the same locality, and so far as comparative cultivation can be ascertained it must be by an inspection of the works carried out with their results in each district, taking into calculation the natural qualifications of soil, climate, and other adjuncts. This I have not attempted, rather preferring to deal with the question upon general principles than otherwise ; but if I have succeeded in showing that after all there is not any great difference between the skill of the cultivator of the north and the cultivator of the south, and which I am free to concede there is not, then I hope to have attained my end, and to congratulate ourselves that if no other good results from this investigation, it may teach us to think less of ourselves and better of our neighbours respectively, so that we may rise up from this investigation, convinced that it is far better to tighten the bands by which we are held together by one common interest than to loosen them when our enemies are closing upon us on every side. The prospects of the farmers, in both the north and south, are not of a very cheering character ; much rests with the landlords at the present moment, and they will act wisely who feel that they have good tenants to make a timely reduction to enable them to maintain their position. Between a small profit and a small loss there is an immeasurable difference. No one can deny that, under the most advantageous circumstances, loss would accrue under prices so ruinously low as those that now prevail ; and the losses have been such, that if great crops could be procured for several years to come, the farmer would not regain his position. Then, with his undiminished expenses and moderate crops, what less than ruin must ensue ? Adversity is the school of wisdom, and farmers have learned that nothing less than strict economy, good seasons, and liberal landlords can ward off the evil that impends over them. I consider that there can be no essential difference between the best lands in the one country and the best in the other, as regards the production of grain ; and therefore if any difference in that respect exists it must arise from difference of temperature. The difference of temperature may not ordinarily be more than two degrees during the summer months ; but in cold summers the difference of temperature is much greater, and moisture has, of course, a tendency to lower the temperature in that part of the kingdom where it prevails most. Thus, when the season is late here, it is very late in Scotland. I have no doubt that the soil of Scotland, or of a portion of Scotland, is of a more productive character as regards grain crops than the soil of this country. We find that in ordinary seasons five quarters of wheat per acre are commonly produced in Scotland. Indeed, all the calculations of the Scotch farmers approach very near that quantity ; and the quantity of oats grown there is far beyond what we can produce. I may say, therefore, that the soil of Scotland is quite as well—perhaps it is even better—adapted for the production of grain crops than the soil of England ; but the atmosphere of England is considerably superior to that of Scotland for the same purpose. As regards the east and west, the same rule applies that I have already laid down. That part of Scotland which is exposed to excessive moisture is not so well adapted to the growth of grain crops as to the growth of green crops and potatoes. I may here observe that there is nothing less to be depended upon than calculations of what can be produced in either country from a given quantity of land. (Hear, hear.) Statements were often inserted in the newspapers by visionaries (Hear, hear) and persons who do not investigate and do not arrive at their conclusions practically, which has a great tendency to mislead; and unless we have something like an impartial investigation on the subject we shall go on groping in the dark, on the one hand the receiver of rent thinking it is competent to the tenant to invest more money in the land than can in reality be invested with advantage, and on the other the tenant expecting more than he can realise. It is quite certain that there is no land which, however well it may be cultivated, may not be made to produce more. But it must be recollected that the application of cultivation to land is, in one respect, exactly like the application of mechanical power to any purpose whatever. You require, for example, a certain power to raise water a certain number of feet; you require a still greater power to raise it higher: as you continue to raise your water, so you must continue to increase the power, until it becomes quadrupled. It is just the same with regard to the cultivation of land. A certain expense will produce four quarters of wheat; you must add one-fifth more expense to produce another quarter, and so on. In proportion as you proceed beyond the point of natural production, you increase the expense. If, however, Mr. Mechi's principle be correct, if the mere application of capital will produce corn, where are you to stop? (Hear, hear.) According to his view, you have nothing to do but to invest your money, and you may produce corn to almost any extent. Now I contend that the contingencies of seasons, blight, and other obstructions to cultivation should be taken into account. If cultivation resembled the application of mechanical power to any ordinary purpose, the doctrine would be correct; but the case is not so: you may apply the power, and the result may be quite different from what you had anticipated. If there is a wet season instead of a dry one, the application of a large quantity of manure may prove quite useless. There will be an inferior crop, and a larger bulk of straw than will support the grain. I have frequently observed—and I dare say many present have done so too—that an injudicious application of manure has done more harm than the value of the manure itself. This may appear irrelevant, but it seems to me closely connected with the question which we have to consider. I have now brought my observations to a conclusion: I will only add, that I feel that I ought to apologize for having troubled you at such length, and that I trust those who are to follow me will be able to throw more light on the subject than I have been able to do (cheers).

Mr. **Gordon** said: I have very few remarks to make on this subject; and I feel that, after Mr. Baker's most interesting and able treatise, anything which I can say must appear very crude and very little to the purpose. Mr. Baker has communicated a great deal this evening, of which I must confess I was before totally ignorant. What he has said with regard to the difference of climate on the western and the eastern coasts of England and Scotland was most interesting, and I think we are all much indebted to him for giving us so luminous a view of the subject (cheers). I could wish that he had been able to investigate himself with regard to the soil. I am afraid he has not been in Scotland. If I could catch him in Aberdeenshire, I should feel much honoured by the presence of a guest who would be so likely to investigate successfully the geological properties of that part of the country in relation to the soil. I have property in Aberdeenshire, and I may remark that in that county, which is as large as Essex and Suffolk together, I do not think a single acre is used for the growth of wheat, the land being nearly all devoted to the production of oats and turnips. Mr. Baker alluded to the remarkable fact that the temperature of Scotland is higher than that of Milan. I think it possible that the temperature of Aberdeenshire, which is put down as a very cold county, is equal to that of London. This year the inhabitants of that county have had a remarkably mild season, and I have had some leaves of a rose-tree sent to me this week, with the view of showing how advanced the season is. Mr. Baker alluded to other causes than climate which may tend to make cultivation in Scotland more successful than cultivation in England. On that point I believe he is perfectly right. Having both English and Scotch property, my experience is, that Scotland is full fifty years in advance of this country in a variety of particulars, and especially in agricultural, statistical, and, what I may call, political matters. For instance, I believe our poor rates are not one-quarter what yours are (Hear, hear). We possess the advantage of having in every parish a resident minister (Hear, hear), who has the care of every soul in the parish, and who has a manse, £150 a year, and seven acres of glebe; pluralities are laughed at, and almost disbelieved in (laughter). Then we have another most valuable person, whose duties are almost equal to that of the minister. This is not a person who is starved on £40 a year. In Aberdeenshire there is hardly a single schoolmaster who has not £100 a year, a good house, with a certain number of rooms, being provided for him under the act of parliament. Accommodation is provided for the schoolmaster, not by the tenants, but by the landlords, who are bound to keep the school in an efficient state; and I have myself been recently obliged by law to rebuild an old school, at an expense of about £200. I belong to two parishes. One is a simple agricultural parish, containing 513 inhabitants, all of whom, except a few small traders, are occupied in the pursuits of agriculture. In that parish our whole expenditure for the poor—poor rates we have none—does not exceed £30 a year. In the next parish there are 1,600 inhabitants, and I do not think the expenditure for the poor there exceeds from £70 to £80 a year. In this country there is nothing like the same economy. The poor law has been extended to Scotland. Out of 800 parishes 276, I believe, have no poor rate. The parishes are not forced to have a poor rate, but at the same time I must admit that the principle of a poor rate is spreading. In Aberdeenshire the tenants have to go 14 miles over a mountainous country to a quarry of the Duke of Richmond's, to obtain lime; and it must be admitted that that is a great disadvantage. They obtain their coals from no less a distance than Sunderland. Therefore, lime and coals are very difficult to get. Notwithstanding these obstacles to improvement, my rents in Scotland have, in the course of 80 years, quadrupled; while in Somersetshire, where there are the finest soil and climate, where there is limestone in every field, where guano has only to be brought eight miles from Bristol, where there is good land and water carriage, and where the roads are excellent, the rents in the same period have not more than doubled. It certainly appears very remarkable that in this one case, where there is everything hostile to cultivation, the rents have quadrupled; while, in the other, where everything is favourable to it, they have only doubled. There must surely be some superiority in Scotch agriculture over English to account for such a difference. There are many things in Scotland which tend to lessen expenses. For criminal prosecutions, for example, we have a public prosecutor; and I believe no one in England who has studied the subject can have failed to perceive how great an advantage it would be to have such an officer in this country (Hear, hear). It must be admitted by all that it would be far better to have a public prosecutor than to leave everybody to act for himself. In Scotland the system has answered so well, that though there exists a power of appeal to the court of session, there has not been an appeal, I believe, for many years (Hear, hear). Then we have another practice in Scotland, which prevails here only to a very small extent. I refer to the granting of leases (Hear, hear). I heard the Duke of Richmond state, in the hearing of a large body of proprietors, that in Sussex he had but one tenant who farmed on lease, while in Scotland he had but one who had not a lease; and he appealed to him (Mr. Gordon) whether leases were not the rule in Scotland and the exception in England? Having a 19 years' lease, the Scotch farmers are much less alarmed than the English. I do not believe there are at this moment two Protection Societies in Scotland. I have heard of one in the immediate neighbourhood of the Duke of Richmond's property, but I believe it is only just organized; and the absence of such Societies shows that there is less alarm at the present state of things in Scotland than there is in this country. In the Lothians they have corn rents. My tenants have not corn rents; and the only deficiency which I have had this year on an estate which returns about £3,000 a year is £4 5s. 6d. The single defaulter alleged the price of cattle as the cause, and he now writes to me cheerfully, informing me that the price of cattle has risen £1 per head. It seems to me that the system of leasing gives a strength and a confidence to the farmer in that part of the kingdom which are wanting here (Hear, hear). I believe every gentleman present will agree with me that here farmers generally are averse to leases. Mr. Baker mentioned a current which comes from the coast of Africa and goes up the St. George's Channel, being connected with the Gulf stream.

[Mr. Baker here pointed out the course of the current on the map; and observed that in the Orkney Islands there was no such thing as natural winter or natural summer, but a sort of universal spring].

Mr. Gordon: Yes, the climate is very mild. The subsoil of Morayshire is warmer than that of Aberdeenshire, and hence agriculturists can grow wheat in one county and not in the other. The climate of Elgin is so remarkably mild, that that part is called the West Indies of Scotland. People go there to reside in consequence of the mildness of the climate, though it is to the north of the districts in which wheat is grown.

Mr. Bennett, from Cambridge, being called on from the Chair, said he had had no intention of addressing the meeting that evening, but he should not do justice to his own feelings or to Mr. Baker if he did not express his obligations to that gentleman for the able and instructive manner in which he had opened the discussion. The mode by which he accounted for the different parts of the kingdom being adapted more especially for the growth of grain, irrespective of soil, was most rational and instructive. He (Mr. Bennett) could also corroborate very strikingly Mr. Baker's statement, that wheat is more hardy, and would contend with greater diversities of climate and other casualties, than almost any other grain. He recollected, upwards of 30 years since, when occupying a fen farm, the bank breaking, inundated a large tract of land; and it was a fact that he could speak to of his own knowledge, that although he had wheat under water for many weeks, so that you might row a boat over it, a large portion of it made a crop after all, while all other vegetation, or nearly so, had rotted on the ground. It was also worthy of observation, the immense powers of this kind of grain to propagate its species. He was no disciple of Mr. Mechi and others as regards extremely thin seeding under ordinary circumstances, although he was free to admit that on high conditioned land the fecundity of wheat is quite astonishing; indeed, if it would pay the expense to separate the offshoots and replant them, it is impossible to say, and almost past belief, how small a quantity of seed would plant an acre of wheat. This fact furnishes a beautiful illustration of the wisdom and beneficence of the All-wise Being, in causing that species of grain of all others, which furnishes the staff of life to mankind, to be not only the most hardy, but to possess such astonishing powers of propagation, that if by any great calamity it should become almost exterminated, by the labour and enterprise of man in a very few years it might again be extended over a large portion of the habitable world (cheers). The subject brought under discussion this evening, by which we are brought to consider those laws of nature by which we learn how it is that we may succeed *here* best in growing wheat, and *there* in growing bulbs, cannot fail to be of great importance to society; and in his (Mr. Bennett's) opinion it was a great misfortune that so bad had the times become, that our most practical and useful agriculturists could now hardly bear the expense of attending meetings of this sort (Hear, hear). He had no doubt that the comparative thinness of the meetings of late was to be attributed more to this cause than any other (cheers). He was glad to see that we were honoured with the company of Mr. Gordon: he had often met him at meetings of agricultural societies in the country. He must say, however, that he could not subscribe to all that gentleman had just advanced. It was very astounding to hear that rents had increased threefold in Scotland within the last 90 years. This must have been effected very largely by the skill, capital, and industry of the tenantry; and he feared in too many instances the improvements of the tenant had furnished the additional source of rent. But it was still more astounding to hear that, notwithstanding the great fall in prices, rents were still well paid among our northern brethren. Mr. Gordon says he had but one defaulter, and that only to the amount of a very few pounds; and this with a reduction of some thirty per cent. in the value of farm produce. It cannot admit of a question, however, if rents are paid now they must be largely paid out of the capital and not the profits of the farmer: it was impossible to be otherwise (Hear, hear). The Scotch farmers, we are further told, are not so loud in their complaints as the English as to the results of free trade. They may have had more capital to fall back upon, and it must not be lost sight of that the Scottish system of paying their labourers in oatmeal and milk very largely instead of in money, as we do, affords another reason why their distress may not be so great as those of our own farmers (cheers). But tenants pay rent generally if they can pay nothing else: the landlord is the first creditor, and no one will go in arrear of rent if he can avoid it; and he believed, therefore, that landlords were greatly mistaken as to the real state of the country. How was it possible to be otherwise? One-third part of the price of the farm in many instances was gone: and had the profits of farming been so enormous, he would ask, that such changes could take place without occasioning the most intense suffering? The English farmer cannot, either, relieve himself by paying his labourers in kind; the English labourer will not submit to eat the oatmeal stodge (laughter); and he did not know why they should, if the object was only to enable the owner of the soil to take to himself more than a just rent (Hear, hear). The picture Mr. Gordon had drawn of the prosperity of the Scotch farmers hardly corresponded with much he heard out of doors, and if the object of those remarks was to show that the present wretched anti-British system could or would be endured, he must demur altogether. He held free trade, as it was falsely called, to be a system of fraud and misery, and he hoped and trusted its days were already numbered (cheers).

Mr. Gordon made a few observations in explanation. Mr. Bennett had spoken as though his (Mr. Gordon's) farms were all large: he was happy to say that the contrary was the fact. When the leases were renewed in 1842 the whole of his tenants continued in the same farms as they had before; and he did not, like many other landlords, make one large farm out of two small ones. The Duke of Richmond, taking a different view of the matter, had swept off the people called crofters, but he believed the result was not satisfactory. One effect was, these persons mingled with the population of the towns, and it was now difficult to get good farm labourers in the neighbourhood. He was happy to say that neither in Scotland nor in England had he (Mr. Gordon) a farm of more than 350 acres. He admitted that at present the price of grain was a great deal too low (Hear, hear); whether any measures should be proposed to make it higher was another question; and, admitting that agriculture was a distressed interest, he believed that those who occupied small farms would best stand the brunt of the times. He was a great favourer of small farms, although in some years he had suffered from that cause. A gentleman had recently complained to him of the badness of the times, saying that he should be thrown out of his position in society; it turned out, however, that he had on his hands 2,000 acres. He (Mr. Gordon) would be almost out of his wits if he stood in the same position. (Hear, hear.) As regarded the Scotch labourers, he would observe that if they were paid partly in provisions and partly in money, most of them were lodged in the farm-houses, and had a good fire to go to in winter evenings; and the position in which they were placed made them feel an interest in the affairs of their employer. The money wages in Aberdeenshire had gone up in the last four years in the proportion of 1 to 3; and, instead of having an overplus of labour, the farmers hardly knew where to obtain labourers.

Mr. Mechi: What are the wages now?

Mr. Gordon: I think the wages are £6 for a labourer for half a year, with provisions.

Mr. Payne, of Felmersham, said: I think some of the observations which have fallen from our friend Mr. Gordon call for a reply. He says, in effect, that in Scotland there is the greatest prosperity where the farms are the smallest. In the part where I live there is the greatest prosperity where the farms are the largest; in fact, we find that the small farms employ no labour at all. (Hear, hear.) In the county in which I reside (Bedfordshire), where labour is at a discount, we find that the farmer who rents only 100 acres can, with the assistance of his family, do all the labour that is required, except, perhaps, that he has a labourer to thrash. In our county, wherever we see a parish composed of small farms, we almost invariably find the prevalence of poverty. There have, within the last few years, been two or three enclosures there. Previously to the enclosing, the parishes were completely pauperised; from 60 to 100 men being seen upon the roads, having nothing to do. After the enclosures had been made, this state of things almost died away; men of capital having been brought into the district, who, by enlarging their business, increased the means of employment. I must say, then, that as far as my observation extends, it goes to show that wherever you have small farms there you have destitution. I do not mean to say that farms should consist of 2,000 acres, but farms of less than 200 acres appear to me quite useless to any person who has to get a living. I am quite sure my friend Mr. Trethewy will bear out my assertions on this subject.

Mr. Trethewy said: Having been appealed to by my friend and neighbour, Mr. Payne, I have no hesitation in rising to confirm the view which he has taken, especially with regard to the comparative advantages of large and small farms. My experience has shown that large farms—by large farms I do not mean farms of 2,000 acres, but farms varying from 400 to 700 acres—give employment to more labourers than is afforded by the same quantity of land let out in small farms (Hear, hear). I will show how that operates. Suppose you have an area of 500 acres, and those 500 acres constitute five farms. If the proprietor of each of the farms have two or three sons, he and his sons are occupied in the cultivation; whereas, if the land constituted only one farm, there would be only one tenant, and the sons, supposing their number to be the same as in the former case, would not be employed in agricultural labour, but in some other way, giving place to the labourers of the parish (Hear, hear). I contend that the larger the farm, the more labour is employed upon it; nor can I see how, if a large farm can be unprofitable to the occupier, a small farm can be profitable (Hear, hear). I contend that a large farm may be managed much more economically than a small one; and on this point I would appeal to any practical gentleman present (Hear, hear). Tenant-farmers want buildings, draining, and so on; and if 500 acres are split up into five farms, you must have five homesteads where one would otherwise suffice. Besides, by offering a farm of 500 acres, you invite a different class of men to occupy.

Mr. Gordon: You invite, but will they accept the invitation?

Mr. Trethewy: Yes; as a land-agent, I have found that there are more applications for a farm of four or five hundred acres than for one of a hundred acres. Men are more ready to invest their capital when the occupation is large than when it is small (Hear, hear). A man who has only 100 acres of land must work like a nigger (Hear, hear, and laughter). He must work with his own hands; whereas, a man who has 500 acres can work with his capital (Hear, hear).

Mr. Mechi said—I feel much indebted to our friend Mr. Baker for the very able manner in which he entered into the scientific part of the question, though I differ from him very much in respect to the conclusions which he has drawn. I do not consider that climate is the primary agent in the cultivation of the soil. I was particularly struck with that by this circumstance: In passing through North Devon, which is especially adapted to the growth of turnips, I saw most miserable turnip crops; whereas, in travelling along the east coast of Norfolk, an arid district, which is most adverse to such roots, I found excellent crops. Everyone knows what has been done by Mr. Hudson on the Castleacre estate (Hear, hear). Mr. Hudson grows in perfection wheat, barley, turnips, and clover; and when I turn from his farm to the western districts, blessed with all the elements of fertility, I find such a different state of things existing, I must say that production depends much more upon art than upon climate. I also differ very much from our friend Mr. Baker with regard to the perfection of agriculture. I wish I could agree with him that good farming is the rule, and bad the exception; but I must confess that my daily travels convince me that the fact is the other way. I do not deny that improvements have been made; but we are on the threshold of agricultural improvement, and I think if we are spared some twenty or thirty years longer, all will admit this to have been the case. I say this very guardedly. If I travel from Romford to Chelmsford, what do I see? Why, little fields of two, three, four, and five acres undrained. I appeal to Mr. Baker whether the fact is not so?

Mr. Baker: No (laughter).

Mr. Mechi (to Mr. Baker): Will you allow that three-fourths are undrained?

Mr. Baker: I should say that three-fourths are drained (renewed laughter).

Mr. Mechi: The cold yellow appearance of the crops appears to me to indicate that their feet are in cold water. There is great reason to believe that the heavy land of Essex is undrained.

Mr. Baker: Where do you mean?

Mr. Mechi; From Romford to Chelmsford.

Mr. Baker: I think that is the worst cultivated part of the country.

Mr. Mechi: Nature has undoubtedly done much by means of climate, and it is our duty to avail ourselves of her beneficial arrangements; but I say it is one of the most dangerous things in the world to say that we are in a happy state of progression as regards agriculture.

Mr. Baker: So do I (a laugh).

Mr. Mechi: I do think the time is coming when the fears of foreign competition will so stimulate agriculture—and when I say agriculture I embrace in my view both tenants and landlords (Hear, hear)—that we shall not only have an abundant supply of food for the country, but also something to spare. I agree with Mr. Baker when he says you may apply too much manure; I agree with him that you may apply too much for corn-crops. But did any one ever find that he could apply too much for green crops? Our Essex friends make a great mistake when they apply a large quantity of manure to corn crops, and starve green crops. With regard to the size of farms, I think the matter depends more on the bulk of the capital than on that of the farm. I am quite sure many persons have no conception what amount of capital may be invested in agriculture in order to obtain the greatest supply of food for the people. I have got to learn that the men who have the smallest amount of capital make the largest profit. My own capital invested in the soil is £17 per acre (laughter). The amount of capital invested in the soil of this kingdom, whether by the landlord or the tenant, is, I believe, quite inadequate. You cannot travel any distance without hearing lamentable complaints of want of capital; and I do say it would conduce to the benefit of agriculture generally if the investment of capital were increased, concurrently with those securities the necessity for providing which has been so ably pointed out at various times by Mr. Shaw (Hear, hear). The time is, no doubt, coming when we must set about improvement; and the sooner we all do so the better. I have heard many of my friends complain sadly of there being so many apron-string farmers. Why, what would have become of agriculture if it had not been for the capital which has found its way to it from commerce (laughter)? I take myself as an instance; and I say it is a happy thing for certain persons in the neighbourhood, both tradesmen and labourers, that the superfluous capital of trade is employed in cultivation. Depend upon it you don't do enough, whether as landlords or as tenants, towards employing the increasing population. I hope you will; and in the meantime I say you should offer every inducement, as landlords and tenants, to draw into the country as much capital as possible from the larger towns.

Mr. R. Smith said: I should not have risen this evening but for the allusion made to the west by Mr. Mechi. Mr. Mechi says he has travelled through the west of England; but though I read of his visit in the daily prints, I did not see him there. He has stated that he saw the wild hills of Exmoor. I farm myself on those hills at an altitude of 1,000 feet, and I am prepared to grow turnips in the ensuing season against Mr. Mechi (Hear, hear). I have been somewhat surprised at the turn which the discussion has taken this evening. I made an effort to be here, because having farmed in my youth in the eastern districts, and having now been thrown into the west, I have seen practically the very great importance of climate; in fact, I think I may say climate is the ruling principle in agriculture. The great plain of the eastern counties is a corn-growing district, owing to its cold winds, its temperature, and the small amount of rain that falls. In the western districts 44 inches of rain fall; while in the eastern the quantity is only 24. This point might be illustrated by travelling, as it were, over the whole of the counties in England. Take the western counties of England. What do we find to be the article of export in the north of Devon? Why the Devon steer. We there see men scarcely growing wheat enough for their own families, because the average mean temperature of the climate is not sufficiently high for the growth of wheat. I have tried wheat at an elevation of 1,000 feet, but it did not ripen until late in the season. Pass on to the next county, and you there find the people more familiar with the growth of corn. Go on to the midland counties, Bedfordshire for example, and what do you see? You find an excellent straw at Dunstable owing to the position of the county. You then come to the eastern districts, where you have beautiful barley and wheat, because of the climate which pervades the district. Mr. Gordon has spoken of Aberdeenshire, and has told us that wheat will not grow there. Surely it must, then, be almost entirely a question of climate (Hear, hear). We have thousands of acres in the west of England upon which there are no plants but those which are natural to the district. You find their position on the north, the south, the east, or the west regulated entirely by the temperature. A few days ago I tried the temperature of an undrained bog, with the view of comparing it with that of a bog which I drained about two years back. The temperature of the drained bog which, before draining, was 44, I found to be 46, at a depth of 12 inches from the surface. In Devonshire the principal feature is certainly the water meadow. The temperature of the springs perceptibly varies in that country. There are two important rivers rising in the Exmoor hills; one called the Ex the other the Barm. The temperature of the bog at the head of each of these rivers is as low as 38. Proceed down the river a quarter of a mile, and you find that it is 39½; and so it continues to increase a little as the cultivation of the district improves.

Mr. Hughes said: I cannot pretend to throw much light on the subject which we are met to discuss; but as there has already been considerable digression, perhaps I may be allowed to digress for a few minutes. As I understand the question on the card, it has reference not only to climate, but to other circumstances connected with different localities which influence the production of grain. My farm is a good deal exposed to the sea, and the exposure operates very detrimentally to the produce; so that instead of wishing my lands to be open, as Mr. Mechi and other scientific persons recommend, I have tried to shelter them. With reference to high farming, I may say that on the green sand-stone formation we find that we can generally produce pretty good green crops, provided we have a warm season previous to the harvest. I have been a high cultivator for some time; and I must say I have been somewhat discouraged by the result. Not only do I find that I am more subject to mildew than I was, in addition to the redundance, but in many cases the mildew is so destructive that five or six quarters are turned into five or six sacks; in fact, the produce is almost rendered chicken's meat. After one or two windy days we frequently find our crop scrawled, as we term it; that is, the straw is broken at the root, and is of very inferior quality.

Mr. MECHI: Is that at blossoming time?

Mr. HUGHES: It is after blossoming time. Some observations have been made this evening in reference to the pressure of the times. I hope it will not be considered irrelevant if I thank Mr. Baker for some bold observations which he made at the Saffron Walden meeting some time ago--observations which I thought did credit to him as a British land-agent, as a British farmer, and as a Christian, and which were both manly and honest. I wish I could agree with Mr. Mechi, that every inducement is offered to the British farmer to exercise his skill and ingenuity. I contend that, on the contrary, there is everything to discourage him; and unless we obtain corn-rents, which I have long contended are the only equitable basis of procedure—(Hear, hear)—I believe agriculture will soon stand still. I am convinced that the farmers in my neighbourhood are continually losing money; and what the result will be I really do not know. Of course the strongest will hold out the longest; but the state of things is altogether quite awful.

Mr. SHAW said: Not having devoted any time to the consideration of what I conceive to be the main and important part of this question, namely, the extent to which climate affects the cultivation of land in this country and in Scotland, I ought not perhaps to occupy your time with any observations; but nevertheless, I am induced—rather, perhaps, in some degree from a selfish motive—to avail myself of this opportunity of making a few remarks in reference to a subject adverted to by Mr. Baker, and thus answering what I cannot so well reply to in any other way. It so happens that, as a member of this club, and also as the medium of communication between Mr. Pusey and this club, I was instrumental in bringing forward that question which has occupied some little attention in Scotland, and has been adverted to by Mr. Baker this evening, namely, the question of a challenge from the southerns to the northerns. I certainly regret very much, as I did at the time, that our friend Mr. Pusey, in commenting on that subject at our annual meeting, should have made the quotation which he did from a certain old writer (laughter). There is one portion of that which I should have been better satisfied if he had omitted. It does so happen that I have been included in the charge of having grossly animadverted on the agriculture of Scotland. Now, to that charge I plead, Not guilty. I challenge any person to mention the occasion when, either orally or by writing, I have used any expression beyond that which I believe every man may use fairly and honourably—the expression of a desire that the same spirit of honourable competition might be induced between England and Scotland as may be felt between Norfolk and Suffolk, and which we see constantly actuating both districts and individuals in different parts of England. I am at a loss to know why there should be any unpleasant feeling with regard to that species of competition, or even with regard to the possibility of defeat. I have been anxious on this occasion to make one or two observations on this point; especially as our friend Mr. Baker in the outset made a remark in which I must say I did not concur, and which he himself to a considerable extent subsequently explained away, namely, that there could be no comparison between England and Scotland, and hence there could be no fair competition. Although it is clear that in Scotland, as in England, difference of climate produces a material effect on the cultivation of the soil; still it appears to me that, so far from it being the fact that our northern friends labour under any peculiar disadvantage, there are certain localities and districts in Scotland which might fairly be brought into competition with certain localities and districts in this country; and I am astonished that our Scottish friends did not willingly accept the challenge which was thrown down. It is true that the eastern counties of England possess peculiar advantages with respect to the growth of wheat, and perhaps it is for a similar reason that, going a little more southward and eastward, we find such a very large quantity of fine produce introduced at this time from France. I suppose it is to climate that we are indebted for the large quantity of flour which is now sent us from France. We are told that in Morayshire wheat is grown in perfection.

Mr. GORDON: And in Ross-shire, too, which is still further north.

Mr. SHAW: It is admitted on all hands, and I suppose the fact is to be accounted for by the principle which has been laid down by our friend Mr. Smith, that oats and turnips are grown in Scotland to perfection; and I believe no man will deny that, whether as regards quantity or quality, Scotland will beat us generally in the growth of those crops. There can be little doubt that a given quantity of swedes grown in Scotland will afford a greater amount of nutritive matter than the same quantity of swedes grown in Essex. That observation will, I presume, be borne out by Mr. Mechi; for when that gentleman was challenged by the men of the north, he did not accept the challenge, but replied—"How can you expect us, with such an arid climate as ours, to grow such swedes as you do in the north?" Hence, looking at the growth of oats and turnips, and in some degree at the growth of wheat, at least in the case of what has been termed "Caird's garden"—I am, I say, surprised that the challenge was declined by our northern brethren; I should at least have expected that, if every other tenant or agriculturist in Scotland declined, Mr. Caird would not have done so (Hear, hear). Without animadverting unworthily upon our friends in the north, I must say I am astonished that, being, as it is stated by Mr. Gordon, full fifty years before us in point of cultivation, having the schoolmaster always at hand, and the clergyman to devote himself constantly in his vocation, and having also in some respects an advantage over us as regards climate, I confess I am astonished that our Scottish brethren did not zealously, readily, and instantly accept the challenge which was given. With respect to the question of the comparative advantages of large and small farms: Mr. Gordon says that his farms are generally small, and he has instituted a not very agreeable comparison between his tenantry in Scotland and his tenantry in Somersetshire. His land in Somersetshire I know pretty well—his Scotch property I do not know at all; and I must say that though there is some good land in the flat portion of his Somersetshire estate, there is also a good deal of rather an indifferent character. When he tells us that his rents in Scotland have quadrupled during the last seventy years, while his rents in England have only doubled, perhaps there may be some important ingredients to be enquired into in instituting a fair comparison between the two estates. What was the original rent in each case? Possibly the rent in England at the commencement of the period alluded to was more in proportion than the rent in Scotland. The Scotch land might have been in the same state as some land in Norfolk was a few years ago; land which, having been worth seventy years back only 2s. 6d. per acre, now produces £1 per acre. (Hear, hear.) I have no doubt there are many cases in England in which the increase of rent within a given period has been quite as great as it has been in any similar case in Scotland. (Hear, hear.) With respect to Mr. Gordon's tenants in Somersetshire, I believe many of them are dairy farmers; and I am sure those of you who know anything of a dairy locality, and who know what a small farm in a dairy district is, will not be surprised to hear that this class of tenantry is not exactly such as a landlord like Mr. Gordon might desire to have. (Hear, hear.) It is true that they pay their rents, but being occupiers of 70 or 100 acres how do they do so? The rent is not made in a regular manner—it is rent scraped together; picked up, as it were, by personal sacrifices, and frequently made up by extreme hard labour and privation. (Hear, hear.) With reference to the question of profit, we are told that farming is the manufacture of food. To a certain extent it must be admitted that it is so; but if farming be the manufacture of food, and if the surplus capital of the magnates of trade, as referred to by Mr. Mechi, is to be employed in the cultivation of the soil, the very same rules must be applied to capital employed in farming as is applied to capital employed in all other occupations. There must be a large amount of capital employed in order to produce a small return in the shape of interest; and in such times as these the large capitalists are the only men who will be able to keep their heads above water. If the farmers, as a class, are to survive, it must be by acting on the principle of ultimately driving out the small farmers, and employing capital in the cultivation of the soil upon an extensive scale in large farms, as it is employed in any other manufacture (cheers).

Mr. SKELTON said—We have heard from Mr. Gordon, not only that he is getting his rents readily, but also that the wages of the poor are being increased. Our friend, Mr. Bennett, says that in his locality neither are rents paid readily, nor are labourers' wages increasing; and, in order to strike a balance, up gets our friend Mr. Mechi, and says, There are a great many complaints made, but the only remedy is to put more money into the business, and then you will succeed (laughter). I have in view two cases in point against Mr. Mechi's proposition. I know a young man, the son of a manufacturer in the iron trade in Sheffield, who came into my neighbourhood to learn the farming business for two or three years. That young man took a farm in Berkshire, near Reading. A month ago I saw a gentleman from the neighbourhood in this club-room, to whom I said "How is our friend going on"?—meaning, the young man of whom I am speaking. "Oh!" was the reply, "don't mention the subject. That young man has sunk £8,000 in three years: he has got his banker to take 10s. in the pound, and he has been obliged to give up." Now he employed capital.

Mr. MECHI: Without judgment.

Mr. GORDON: Did he employ head as well as capital?

Mr. SKELTON: The other case in point is that of the gentleman who has told us to-night that he has applied to his land £17 per acre (laughter). After a little conversation with Mr. Mechi, in reference to his mode of managing his farm, and following up his principle of employing a large capital, I asked him whether, after all, his farming had paid him? (Hear, hear). His answer was, "I hope it will." So that we have the case of this manufacturer's son going into the business with plenty of capital, and sinking £8,000 in three years; and we have the case of Mr. Mechi, who preaches to us the doctrine that we should lay out £17 per acre upon our farms, and hopes that he himself shall get a return (laughter). My desire is, that some practical good may arise out of this discussion, and though there has been much digression from the question on the card, I apprehend that that will not prevent such a result. As to Mr. Mechi, I think he should have said something more satisfactory than he has done, in telling us that he has employed capital which is evidently not paying him.

Mr. GORDON wished to observe that a bill was about to be introduced by Mr. Baillie Cochrane into the House of Commons, by which it was provided that the money lent for draining, in pursuance of the proposal of the late Sir Robert Peel, and subsequently of Sir Charles Wood, might be applied in building farm houses as well as in drainage. He considered that a very good proposition, and believed its adoption would tend to the improvement of agriculture.

The CHAIRMAN said: Perhaps Mr. Gordon and the members generally are not aware that a company exists which, under the provisions of an act of Parliament, affords facilities to landlords to invest money in improvements—in draining and building—in the case of estates which have tenures for life only. The Land-drainage and Improvement Company have had powers given to them which have not been granted by the Legislature to any other company. Even Mr. Mechi was not aware of this a short time ago; and I think it desirable that it should be generally known. I have myself joined that company, believing it to be for the general good; and I do think that landed proprietors who have only a life-interest in their estates would do well to turn their attention to this medium of effecting improvements in building and draining in a way that they could not otherwise be accomplished. Allow me to say that, though I am anxious that there should always be as much latitude as possible in our discussions, nevertheless, I should consider myself culpable if, as the Chairman of one of your meetings, I allowed this Club to be made an arena for political discussion; and I am satisfied that it would be injurious to the Club, as regards the position which it holds in the eyes of the public, if we allowed ourselves to depart from that principle (Hear, hear). Still, the wording of the question on the card is such, that I do not think I could well have allowed the discussion to take any other course than it has done (Hear, hear). The question has reference to soil, climate, and "other" circumstances affecting the cultivation of land. Therefore, I hope you will agree with me that I have acted rightly in allowing the subject to take rather a political turn. I cannot agree with Mr. Baker that bad cultivation is the exception throughout the kingdom; on the contrary, as an agricultural improver, I consider that good cultivation is the exception (Hear, hear). I must say that, travelling throughout various districts of the kingdom—Norfolk, Suffolk, and Essex, for instance—

Mr. BAKER: I spoke merely of the eastern counties.

The CHAIRMAN continued—I have never seen a farm in which there was not palpable room for improvement. I could not sit here quietly, and allow Mr. Baker to assert that bad cultivation is the exception. I admit that in the present day it would be unwise to invest more skill and capital in the soil, at all events to the extent to which Mr. Mechi goes, unless an end is put to uncertain legislation, and confidence restored throughout the country; but I also think it would be very unwise for us to rest quietly in the conclusion that we are doing as agriculturists all we can do, and could not do more even were security and encouragement given us in reference to the cultivation of the soil (Hear, hear). I am aware that very much depends on the temperature in different parts of the kingdom, but I cannot go to the extent that Mr. Mechi does in saying that we frequently see in the eastern counties fine crops of turnips, notwithstanding the fact that the temperature is against them, whereas in the west of England, with a favourable temperature, the crops are generally bad (Hear, hear). There is one important point which has not been touched upon this evening, namely, that while this island is materially affected by temperature, it is equally affected by the vicissitudes of seasons. It is, in fact, more affected by such vicissitudes than any portion of the continent of Europe, and therefore in Norfolk that which is beneficial for the growth of turnips in one season is injurious in another. I will not now enter any further into the question, except to say that it is a question which ought to be looked into both by farmers and by the public. It ought always to be borne in mind that the British farmer has to contend with a climate and with vicissitudes of season which do not affect the continental and American cultivators to anything like an equal extent.

Mr. Baker replied.

Mr. Shaw proposed the following resolution—"That the cultivation of land in England and Scotland is to a very great extent affected by soil and climate, although the limited information possessed on this subject renders it impossible to define the extent; it is, however, quite apparent that the pressure arising from present low prices is greatly mitigated in Scotland by corn rents and the payment of labour in kind."

Mr. Baker seconded the resolution, which was adopted.

Thanks were voted to Mr. Baker and to the Chairman, and this terminated the proceedings.

ON THE MANAGEMENT AND FEEDING OF FARM HORSES.

BY D. HORNE, ESQ., OF LANGWELL.

Read at the Annual Meeting of the Agricultural Society of Caithness on the 28th ult.

Edinburgh, Atholl Crescent,
20th February, 1851.

Alex. Henderson, Esq., Yr. of Stemster,
Secretary Caithness Agricultural
Association.

My Dear Sir,—You are aware that, as it is not in my power to be frequently present at the meetings of our Association, and as, therefore, I have few opportunities of expressing my opinions, or communicating any information I may have acquired to the Association in any other way, I had resolved to address you on some points which I think are deserving of serious consideration; and as it is in the power of any member to test the accuracy of my views, I shall do so with the less hesitation. I regret, however, that my spare time has not admitted of my noticing any point but that of the feeding and management of farm horses, in which I think there are both carelessness and inexcusable waste, and therefore I shall confine myself for the present to that point alone, though, if the communication have the effect of drawing the attention of the Society to the subject, I may hereafter address you on other no less important matters to our district.

You will see that, as my acquaintance with what takes place in other establishments is limited, I have drawn my experience from my own farms; and if I am worse than my neighbours, then I do them no harm, while I freely give them the benefit of abuses which I try to correct within myself.

But to proceed. My work horses at the different establishments are pretty nearly of the same size and stamp; and therefore, one general rule for feeding will apply to them all.

My orders to my servants, therefore, are—

1. That all oats intended for horses shall be uniformly dressed to the weight of 36 lbs. the bushel by mixing the small corn out of that intended for the mill or for sale with those to be used for the horses. A measure of corn, if not of the same weight, will not regulate the proper feeding of the horses; and, if bruised, there will be perfect regularity if given by weight, accompanied by economy, as the small corn is profitably used.

2. That the oats shall all be bruised in a bruising-machine or broken on the mill, though the former is preferable.

3. I think that the most critical season of the whole year for work horses is from the middle of September till the end of October. They should not be out all night during that time, and should then get hay for six weeks until straw is seasoned in the stack; and therefore each horse should, from the middle of September until the turnips are laid down, get the rate of 9 lbs. per day of this bruised oats, half before yoking in the morning, and the other half at mid-day, subject to the variations, and in addition to the mashes, &c., to be hereafter noticed.

Note.—If laid off work by frost and snow for any considerable time, they need not feed so high.

4. That each horse shall, after the first of November, when straw feeding begins, get 30 lbs. weight of boiled mashes, made up of yellow or Swedish turnips, small grains and chaff, and about a pound of bere of the weight of 45 lbs. the bushel, with a good handful of salt, all well steamed, mixed, and cooled: and that this shall be given in two feeds, one half on coming in from work, and the other half at supper time. Care must be taken to have it properly cooled before it is given to the horses.

Note.—I am not so sure of the right quantity of bere to be used, and the grieves must judge: I think it rather too much.

5. By the time the Swedish turnips are done, if cut grass is not ready, the mashes, or evening feed, must be continued, made up of cut hay, bere, and oat chaff, but of less weight; and after the cut grass comes to be used, and mashes given up, the horses must get 12 lbs. of the bruised oats each, until the turnip sowing is over, in three feeds.

6. I am determined not to allow a horse, on regular work, to be turned out to pasture just as he is unyoked. He must, if possible, get cut grass or tares in the house, with a less allowance of bruised corn, say at the rate of 6 or 7 lbs. a day, divided into a morning and forenoon feed. I am aware that in some establishments it may be difficult to comply with this rule; but if they must be turned out at night, they should be previously cooled and cleaned. It is from want of such cleaning that horses catch cold, which frequently generates into the most fatal diseases.

7. The cleaning of the mangers and boxes is seldom or ever attended to; and they are frequently half full of decomposed vegetable matter and dirt. This must be done the moment the horses leave the stables in the morning by the servant in charge of the steading and young stock.

8. Next comes the equally important point of cutting the fodder—both hay and straw. I have made very minute inquiries on this subject, and the result is, that I am resolved that, before the month of April, no work horse of mine shall get hay in the spring, and that both hay and straw shall be cut. Machines for bruising oats, and for cutting fodder, such as I have seen in use in other places, will be provided immediately, to be worked by the thrashing-mill power. I do not intend to restrict the quantity of cut straw to be given to the horses; but what is left in the morning must be immediately turned into the straw yard for the pigs, and the mangers or cribs cleaned out. When the horses are on cut hay, I am satisfied that 14 lb. a day will be ample, if not more than sufficient.

9. When they get cut hay, the best judges say that 2 or 3 lbs. less corn will be sufficient; but if it is found to be necessary to keep them in good condition, as I intend only to allow hay for the first six weeks after grass, and during the time of hard work in spring, I am not inclined to order a diminution of their 9 lbs. of bruised oats to each horse during the time they are getting mashes, and, after the mashes are discontinued, 12 lbs. of oats during turnip sowing.

10. With regard to young horse stock, it is not necessary to give any other directions than that they should be kept warm and clean, and have plenty of room; and they should have as much cooked food as possible during the winter and spring. In fine weather they should be let out daily for a short time. Nothing is worse for them than lying out without shelter after the middle of September. They are better under cover through the night, even without any other feed than some straw or tares.

In conclusion, it is more for the sake of the proper treatment of the animals than pure economy that I give these instructions, though in such times the latter must not be overlooked; and, if these instructions are strictly followed, I am satisfied the horses will always be healthy and fit for their work, and be kept at little more than half the expense wasted on them at present.

I shall give my calculation of the expense of the keep of each horse:—

1st. *From the middle of September till the end of March—say* 30 *Weeks.*

9 lbs. of oats per day for 30 weeks, at 36 lbs. the bushel, is 6½ qrs., at 12s.	£3	18	0
Suppose half a qr. of bere, 45 lbs. the bushel, for each horse, at the rate of a lb. a day for mashes, at 16s. the qr.	0	8	0
75 cwt. or about 3½ tons of yellow or Swedish turnips, say	2	0	0
Salt, say	0	2	6
	£6	8	

2nd. *From April to June—say* 10 *Weeks.*

9 lbs. of oats per day, 2¼ qrs. at 15s. (see note afterwards)	£1	13	9			
Bere same period, say 2 bushels, at 16s. per qr.	0	4	0			
23 cwt. turnips	0	13	4			
14 lbs. hay, at 6d. per imp stone	1	15	0			
Salt	0	1	0			
				4	7	1

But if the mashes of boiled bere, turnips, &c., are discontinued, then 12lbs. of oats a day to be given, which would be about the same expense.

3rd. *For* 12 *Summer Weeks.*

Cut grass and tares, or pasture, at 6d. a day	£2	2	0			
7 lbs. oats per day, 2 qrs., at 15s., oats being higher at this season	1	10	0			
Hay for six weeks	1	1	0			
				4	13	0
Total cost for the year				£15	8	7

Note.—No value is put on straw chaff &c., as the manure is obtained.

According to the above arrangement and calculations, about 120 imperial stones of hay would be needed by a horse; while I am satisfied that, generally speaking, the farm horses on many farms consume, or rather destroy, 300 stones each.

Result.

Consumed by each Horse.

Oats—10 qrs. 6 bushels, at 36 lbs. the bushel	£6	15	0
Bere—6 bushels, at 40 lbs. the bushel	0	15	0
Hay—16 weeks, an imperial stone per day—120 stones..	3	0	0
Turnips and salt	2	16	7
Cut grass and tares, or pasture	2	2	0
	£15	8	7

The greatest care is required that all steamed or boiled meat, both to old and young horses, shall be properly cooled before it is given to them; but not by throwing cold water on it, as I understand is the practice on some farms, but by spreading it out, and allowing it to cool gradually.

If you think it worth while to communicate this to the Association, I hope you will favour me with any remarks that occur, for my guidance in my own practice.

I am, my dear Sir, yours very truly,

D. Horne.

ON DRAINING.

The question was once asked, "Can any good thing come out of Nazareth?" and it may not inappropriately now be asked, can any new thing be said on deep draining? But as the negation implied in the question was by no means accurate, so it is possible that some new idea—some new practical fact, at least—may be advanced on the subject of drainage.

We have had the experience in drainage of theoretical men—we have seen theories constructed and demolished with the facility of the Russian palace of ice; but we have now before us the experience of a practical man—a gentleman who has had the charge of some sixty thousand roods of drains, and who has overlooked the expenditure of nearly four thousand five hundred pounds. The experience of the writer, or at least his observation, extends over twenty-five years; and he now comes out in a valuable paper, read on the 11th of last February, before the Hexham Farmers' Club.

We have known Mr. William Goodrich, the author, for some thirty years. We have admired his judgment, his skill, his practical character; and if we do not accord with the entire dicta of his observations, we attribute it not—and it must be considered—not as any doubts of his judgment or powers of observation, but as applying strictly to that particular district of Northumberland to which his labours have been confined.

But with very much we agree. He lays down several details of practice overlooked by far too much in every treatise on drainage we have seen, which are invaluable pieces of information to those who wish to struggle successfully with the mysteries of the art.

Amongst these are the proper digging of trial holes—first, to ascertain the depth of the water; secondly, to try the distance the fields will drain; and thirdly, to afford an opportunity to those who take the work to observe the nature of the soil and the amount of labour requisite to perform the cuttings.

The main drains, he very properly observes, should be at least *a few inches lower than the branch drains*, so that the water falls out of the branch drains nearly on the top of the mains; so that, if the mains are venting a great deal of water in a rainy time, there may still be a vent into the main drain. The size of main drains he fixes as follows: To drain six acres of land the three-inch bore pipe, and for ten acres a four-inch bore will be sufficient.

The size of pipe for the branch drains he recommends to be one and a-half to two inches; and he appears to prefer a full stream in a small tile, because, by so doing, he urges any obstruction would be more easily forced out. Now we neither agree with the one proposition nor the other. A given quantity of water will have the same power in a one or two or five-inch bore tile, if it be exposed to the atmosphere, at the same level; and the danger of canting is so great in a tile of such small bore that it very much endangers the entire stability of the drain. We are somewhat sorry that so small a dimension is recommended by so good a man. It is treading on the verge of danger; and to say that he will not condemn, as he does say, the one-inch bore tile in three feet draining, is, by implication, to sanction the most reckless of all practices—that of incurring all the cost, and risking after all the security of the drain.

But we quarrel most with his plea for the outrageous uniformity of a four-feet deep drain. After alluding to the varieties of opinions, that in favour of deep draining for all soils, of deep draining for porous subsoils only, and of shallow draining for all, he says, "I consider that a depth, when attainable, of four feet is generally the most effectual, the most permanent, and also the cheapest or most economical depth of drain." Now we cannot understand this. We know soils, and he years ago knew soils, where a seven feet drain was, beyond all question and all doubt, infinitely the most effectual, perfectly permanent, and, above all, decidedly the cheapest; and therefore, unless he confines his remarks to clays, we cannot coincide with him; and, if he does, we must also aver with Mr. Pusey, once an indiscriminate four feet drainer, that there are some clays which will not bear a drain so deep as four feet. If his observations were limited to his own district we doubt not they were right; but, without that limit, he makes them apply generally, which we cannot for one moment be induced to admit.

To show the cheapness of four feet drainage over three and five, he gives us the following data:—

	Three feet.	Four feet.	Five feet.
Distance of drains	27	39	51
Roods of drains per acre	77	53	40
Cost of cutting per rood	7d.	10½d.	1s. 4d.
Cost of cutting per acre	£2 4 9	£2 6 4	£2 14 0
Number of pipes per acre	15100	1100	850
Cost of do. per acre....	£1 10 3	£1 1 6	£0 19 0
Laying pipes	0 4 6	0 3 9	0 3 0
Carting two miles	0 4 0	0 2 9	0 2 6
Other expenses	0 6 0	0 6 0	0 6 0
Total cost per acre	£4 9 5	£4 0 4	£4 4 6

Now, though this table is most carefully and accurately drawn up, and evidences the hand of a man practically acquainted with his business, we do not see that he makes out a very important case. If his reasons are valid for a four feet drain, we do not see why they are not more so for a five; and if the difference is so slight as four shillings per acre, the cost is not worth a moment's consideration.

Mr. Goodrich is a clever, a judicious, a clear-headed man, and we are sorry he has wedded himself to a system of limited application.

There is in most men a passion for uniformity. In arrangements purely mechanical it is orderly, it is beautiful, it is useful. But if we wish to carry this out in nature we find her abhor uniformity. Wherever vitality comes in question it is scattered to the winds. Thus a machine, or a building, or a railroad, requires one uniform system of arrangement; and no diversity can be depended upon, for giving results in common. But in breeding animals, in fatting stock, in growing crops, or in farming processes generally, uniformity is impossible. Soil is not uniform—climate is not—aspect is not—plants and animals are not; and hence it is an unrealised imagining, to conceive its universal application in nature.

And yet men say you must drain *four feet*. Look at a fine loamy soil full of land-springs—you hear, drain it four feet! See a strong tenacious blue clay, holding top water like a pot—oh, yes, it must be drained four feet! Nay, take a light blowing sand, with its springy bottom, and again you hear—aye, aye, drain it *four feet!* Now all this is monstrous twaddle. It is a law of uniformity in the four feet, as the Deanston system was one of 30 inches. And yet the Drainage Commissioners recommend it—the drainage surveyors direct it—the government money borrowers adopt it. And why? because it is easier to adopt some charlatan depth, than to find brains to adapt to each peculiar case its special appliances.

We have from the very first objected to the uniform four feet. There may be ten or ten thousand instances of its success; it has not been proved in many of these, however, that a vast expense might not have been saved, and the work as efficaciously done, by a smaller depth. For some subsoils it is adapted—it ought to be pursued; but as a general rule it is as absurd as any other—as feeding sheep on all soils, even wet clays—as feeding cattle on all grass lands, however poor. To recommend it *in all cases* is worthy a quack rather than an enlightened improver. Why, it has failed in Phœnix Park; it has failed at Strathfieldsaye; it has failed with Mr. Mason, of Farrington—Mr. Randall, of Chadbury—Mr. Bayles, of Evesham—Mr. Moore, of Swanton—Mr. Etheredge, of Stirston—Mr. Baines, of Staplehurst—Mr. Tunston, of Woodlands; or if we go to Scotland, we might name Mr. W. Scott of Craiglock, Mr. Furnie of Swanston, Mr. Hope of East Lothian, or Lord William Douglass of Balcastrie. And yet reckless obstinacy pursues it! Nay, Mr. Pusey, who in his evidence before the committee of the House of Lords in 1845, advocated draining the stiffest and coldest clays in England with inch-pipes four feet deep, now has the manliness and ingenuousness to declare that four feet draining is too deep for some kinds of clays.

We have said thus much in justification of our opinion as to the utter fallacy of recommending any uniform depth for all soils, much less an uniform four feet; and we shall not spare any one who endeavours to palm any such system on the community. Nay, we but yesterday saw a trial hole in a retentive blue clay, standing edge full of water, not three feet distant from a four feet drain. And yet, according to some wiseacres, no other depth must be attempted, because it is unscientific to do so!

We are glad also that Mr. William Goodrick, on whose paper we animadverted a few weeks ago, has rescued himself from the too much apparent leaning to a four-feet uniformity, as his letter below will show most satisfactorily. His paper, of a local character, referred to the specific locality in which it was read; and therefore he is not to be called as a witness for the uniform four feet—" the four, all the four, and nothing but the four." We have great pleasure in giving his letter entire.

" TO THE EDITOR OF THE GARDENERS' AND FARMERS' JOURNAL.

" Sir,—Having read in your *Journal* of March

29th a notice of a paper that I read at the monthly meeting of the Hexham Farmers' Club, I beg to offer a few remarks in explanation of what I then stated.

"When the members of the club requested me to introduce draining as a subject for discussion, they desired me to confine myself to my own experience *only*, and which I did as much as possible. You must have observed, when I stated at the outset that 'I would give my own opinions and convictions resulting from the *experience* I have just stated,' that I was confining myself to this, and this alone; therefore the paper I read as the introduction to an animated discussion, at once shows itself to have been confined to *this district*. If, in the few imperfect remarks I then made, I have appeared to contend 'for the outrageous uniformity of a four-feet drain,' it must have been because I have drained more at that single depth than any other; and for this reason, that in five cases out of six I find no water until I get to a depth of three and a-half feet, and in the next six inches a large quantity. My remarks, however, were not so much intended to advocate that depth in preference to others, as to show that *deep draining* (or all depths above three feet) was in *general* more effectual, permanent, and economical, than shallow drains (or all depths below three feet). Hence my remarks 'to show that *deep draining* is the most permanent,' &c., and 'having endeavoured to show that deep draining is the most effectual;' and if my calculations (made from the 'experience just stated') did exhibit a *balance* in favour of a depth of four feet being the most economical or cheapest, it was no fault of mine.

"At the same time I fully agree with your remarks as to the utility in some cases of seven feet drains, having had some of that depth put in, and I can show an instance where drains of six feet are likely to be more efficient than those of any other depth; but I certainly find the expense of these deep drains to be much heavier than shallower ones: the seven feet drains you speak of, having been by observation only, I have no means of ascertaining the cost. As a proof, however, that what is applicable to one district may equally apply to another, I have the testimony of a gentleman of extensive experience, and who inspects a large amount of draining in the counties of York, Durham, and Northumberland, that he *generally* finds the land much better drained above, than below, three and a-half feet.

"In answer to your objection to my remark that I would not condemn the use of one-inch pipes in strong clays, at a depth of three feet, my reason is, because at that depth, in strong clay, I see so little water; therefore a pipe of that dimension would be quite sufficient for draining purposes. And as to the danger of 'canting' which you fear, I cannot conceive that any one would 'be so reckless' as to use pipes of that small dimension without collars, which would at once remove the danger.

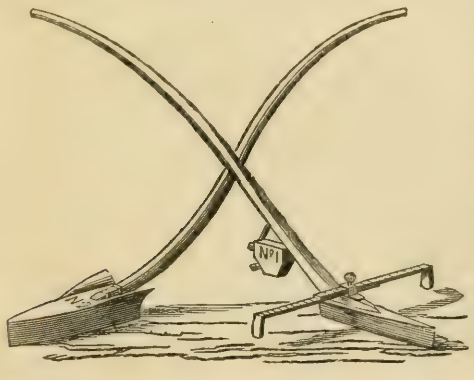
"WM. GOODRICK.

"*Sandor, Hexham, April 10th*, 1851."

We think if collars be necessary to one-inch bore pipe tiles, it were better not to use them at all. —Gardeners' and Farmers' Journal.

GARDEN DRILL.

We have in the following engraving another of those very modest inventions, which is designed much more for use than display, and this can only be said for some of the inventions which are from time to time brought into notice. For light garden ground, moderately well prepared, as all garden ground is supposed to be, Webb's drill is likely to be an acceptable implement, and what is also important, it cannot be a dear one. We learn from the inventor that he has been a head gardener for nearly 20 years, and is not therefore surely liable to be charged with inexperience and boyish fancies. Mr. Webb asserts that he has used this drill for some time, and finds it very useful; we are the more inclined to trust this testimony, since he declines to sell the right to manufacture his invention, and cannot therefore have any pecuniary interest in commending it. Besides the engraving the following description may enable the reader to more fully understand it:



"No. 1 is constructed to drill and sow the smaller descriptions of seeds, such as onions, turnips, carrots, spinach, red beet, &c., without the aid of either staff or line; the slides, which are graduated, effect the twofold purpose of regulating the distance (from 12 to 20 inches) and guide the drill when in action. *Directions for use.*—After carefully preparing the ground by digging and raking the surface even, fill the seed box about half full. Proceed then to form the drill: in doing which, the implement must not be simply pushed forward as an ordinary plough, but a backward and forward motion must be given, that will agitate the seed in the box and distribute it in any required quantity in the drill, which may be regulated at pleasure by opening or closing the double slide at the bottom. No. 2 is for forming drills for peas and beans, similar in action to No. 1; but for long drills a line should be used, elevated about six inches, so that the plough can work under. For short drills, however, the line may be dispensed with, the eye being a sufficient guide. With a little care and attention at first, the operation of sowing is rendered simple and expeditious, and the regularity with which it distributes the seed, gives the implement (No. 1) great advantages over the ordinary methods of drilling and sowing."

Though we have not had an opportunity of instituting an actual experiment, there appears no reason to doubt but that in dry weather, and with fine light soil, these drills might be found very convenient in sowing the sorts of seed specified. The handle is about five feet, and the "plough" sixteen inches long. The implement on the whole is light, and capable of being worked with ease. With respect to the cost at which they may be made we have no positive information; but particulars on this point may be readily obtained by application to Mr. Webb, Eccleshall Castle, Staffordshire.—Ibid.

COLLINGWOOD; Winner of the Royal Hunt Cup, 1849.

Collingwood, bred by Mr. George Payne, in 1843, is by Sheet Anchor out of Kalmia, by Magistrate, her dam Zephyrina, by Middlethorpe—Pagoda by Sir Peter.

Collingwood is a bright bay horse, standing nearly sixteen hands high: he has a clean blood-like head, very beautifully set on to his neck, which is muscular and inclining to arch; he has strong shoulders, if anything a little heavy at the point, deep fore ribs, round barrel, powerful back, with immense quarters, thighs, and arms, good clean short legs, and plenty of bone. He carries his tail up, and well away from him, and looks when mounted what he has so signally proved himself to be—a very game and good racehorse. From the excellence of his form, coupled with the peculiar brightness of his coat, he offers on such occasions a most splendid model for an artist—one, though, that we must say we think Mr. Hall has done full justice to in his portrait.

SUMMARY OF COLLINGWOOD'S PERFORMANCES.

In 1845 he started nine times, and won six:—

	Gs.
A match at Ascot Heath .. .. Value clear	200
A sweepstakes at Goodwood	300
A match at Newmarket First October Meeting	200
Another match at Newmarket First October Meeting	200
A match at Newmarket Houghton Meeting	100
A match forfeit at Newmarket Houghton Meeting	75

In 1846 he started thirteen times, and won three:—

The Cowdray Stakes at Goodwood	100
The Amateur Stakes at Egham	95
A handicap sweepstakes at Newmarket Second October Meeting	240

In 1847 he started eight times, and won once:—

The Chesterfield Cup at Goodwood	435

In 1848 he started nine times, and won four:—

The Grosvenor Stakes at Chester	Gs. 75
The Dee Stand Cup at Chester	120
A plate at Newmarket Second October Meeting	50
The Oatlands Stakes at Newmarket Second October Meeting	70

In 1849 he started nineteen times, and won twelve:

The Trial Stakes at Northampton	120
A handicap sweepstakes at Northampton	135
The Orange Cup at Croxton Park	395
A sweepstakes at Newmarket First Spring Meeting	60
A handicap sweepstakes at Newmarket First Spring Meeting	80
The Trial Stakes at Ascot Heath	65
The Royal Hunt Cup at Ascot Heath	530
A plate at Newmarket July Meeting	50
The Cup at Brighton	220
A match at Newmarket First October Meetng	200
A plate at Newmarket Second October Meeting	50
A match forfeit at Newmarket Houghton Meeting	100

In 1850 he started twelve times, and won eight:—

The Trial Stakes at Northampton	120
A match at Newmarket Craven meeting	200
A plate at Newmarket Craven Meeting	50
The Lansdown Stakes at Bath	190
The Grosvenor Stakes at Chester	45
The Craven Stakes at Epsom	150
A plate at Newmarket July Meeting	50
The Dundas Stakes at York	65
Started seventy times, and won thirty-four	5,135

Collingwood was taken out of training at the close of last season, and purchased of Mr. Rolt during the winter by Mr. John Villiers Shelley, of Maresfield Park, Sussex, where the horse now covers. See "Stallions for the Season" in the present number of the Farmer's Magazine.

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

(From the Morning Chronicle.)

LETTER XVIII.

NORFOLK, SUFFOLK, AND ESSEX—THE HERRING FISHERIES AND FISHERMEN OF YARMOUTH.

Before proceeding to describe the state of agriculture and the condition of the agricultural labourer in Norfolk, I propose, in the present letter, to give some account of the fisheries and fishermen of Yarmouth; although there are several places besides Yarmouth where fishing-boats are fitted out, both in Norfolk and Suffolk, still, as most of them find their way to that town with the produce of their fishing, it will be unnecessary to enter into any details respecting him. The same remark will also apply to the port of Lowestoft—the boats which belong to that port being all registered as belonging to Yarmouth.

The borough of Yarmouth itself stands upon a narrow neck of land at the extreme southern end of the county of Norfolk. On one side of the town is the sea, and upon the other the river Yare, which at this part forms the boundary between the counties of Norfolk and Suffolk. The quay is perhaps one of the finest in England, being upwards of a mile in length, and of proportionate width, and colliers and other vessels are able to discharge their cargoes immediately upon it. Great quantities of agricultural produce are constantly brought down to Yarmouth from Norfolk and Suffolk for the purpose of being exported, coastwise, to various parts of the country. Not less than 100,000 quarters of corn were exported from the town during last year, and upwards of 200,000 tons of coals were brought into the port for the consumption of the neighbouring counties. Great quantities of the produce which was formerly sent by way of Yarmouth is now, however, carried by the railways, and the trade of the place has consequently fallen off during the last few years. The gross receipts for Customs duties at the port of Yarmouth were, in 1846, £52,457; and in 1847, £59,784. The amount received by the corporation for pier dues during the year ending the 3rd of January, 1845, was £10,188, being upon an average of 6d. per ton on 269,289 tons of coals; 2d. per ton on the register tonnage of 224,880 tons; and 1d. per quarter on 304,118 quarters of corn. The number of arrivals and sailings was 2,837.

There are few towns in England which are more densely populated than Yarmouth in proportion to its extent. In the eastern counties there is no town which approaches anything near to the same proportion. Ipswich, one of the chief towns of Suffolk, has an area of 7,020 acres, to a population of 25,384—being about 3·6 persons to an acre. Bury St. Edmund's, also in Suffolk, has 3,040 acres, to a population of 12,538—or 4·1 to the acre. Colchester and its liberties has 11,770 acres, with a population of 17,790—being no more than 1·5 to the acre. Harwich, a port of Essex, stands upon 2,060 acres, its population being 3,829, or about 1·3 to the acre. Norwich contains 5,920 acres, and a population of 62,344 - being 10·5 to the acre, Yarmouth, however, contains 1,270 acres, and its population amounts to 27,750—being at the rate of not less than 21·7 persons to the acre, or more than double that of Norwich, six times that of Ipswich, five times that of Bury St. Edmund's, and nearly fifteen times that of Colchester and Harwich. The extraordinary density of the population of Yarmouth may be accounted for by the peculiar style of building which is adopted. Along the whole line of the quay, and running at right angles to it are a vast number of narrow streets, or "rows," as they are called—few, if any of them, exceeding six feet in width. These "rows" are numbered consecutively from 1 to 136; there is no foot-path up any of them—they are paved with small round stones, and drained down the centre. Many of them are so narrow that an ordinary-sized vehicle would be unable to pass through them; hence the curious little carts or barrows which abound in the town, of about three feet in width, with the wheels placed under the body, in order to take up as little room as possible. The poor rates are generally exceedingly heavy. In 1848 there were only twelve unions, in the whole of England and Wales, which were rated higher than Yarmouth, the rates being then 4s. 10½d. in the pound for the year. Since that period the rates have even increased to 1s. 7d. in the pound for the quarter—being at the rate of 6s. 4d. in the year. The last rate, which was made at Michaelmas, was only 1s. 2d. in the pound for the quarter. The annual value of the property rated to the poor is £34,315, and the number of paupers relieved during the year ending Lady-day, 1848, was 9,795.

The enormous extent and importance of the herring and cod fisheries of the east and north-east coast of Great Britain may be judged of by the following facts. The number of boats, decked and undecked, which are employed in the fisheries is 14,126. The fishermen and boys who man the boats amount to 59,859; coopers, employed in the manufacture of barrels for the salt and dried fish, 2,334; persons engaged in packing, repacking, cleaning and drying the fish, 28,254; labourers otherwise employed in carting the fish, bringing it ashore, and other matters, 7,074; fish curers, 1,572. 1,636 men, with a tonnage of 22,758 tons, are annually employed in carrying salt for the fisheries direct from Liverpool or other ports, and 2,325 men, with a tonnage of 31,926 tons, obtain employment in exporting the fish, when cured, to foreign ports. The number of men, therefore, employed in connection with the fisheries is—

Fishermen and boys	59,859
Coopers	2,334
Packers and cleaners	28,254
Labourers	7,074
Fish curers	1,572
Employed in carrying salt	1,636
Employed in the export trade	2,325
Total persons employed	103,054

The tonnage of the vessels employed is—

Boats employed in the fisheries	90,273
Carrying salt	22,758
Exporting the fish	31,926
Total tonnage	144,957

The total value of the boats, nets, and lines, employed in these fisheries, is £908,586. The number of square yards of netting used in the herring fisheries is 68,014,243, and the number of yards of long and hand lines, and buoy ropes, is 23,151,729. The quantity of herrings cured during the nine months ending January, 1846, was 526,032 barrels, 140,632 barrels branded, 266,373 exported, and 117,606 assorted after the Dutch mode. The number of barrels which were taken, and promptly disposed of for immediate consumption, during the same period, was 295,664. In the cod and ling department, the total quantity taken was 491,650 hundred weights. Taking the value of the barrel of herrings at 20s., and the cod and ling at 10s. per hundred weight, it will be found that the value of the produce of the fisheries of the eastern and north-eastern coast of Great Britain is not less than £1,592,132.

The exact proportion contributed by Yarmouth towards this enormous amount I am not able to state. The returns which are published by the Board of Fisheries do not give the number of tonnage of the boats in connection with Yarmouth—that port being included with Dover, Portsmouth, and Gravesend, in the London station. Having been given to understand that a register of the fishing-boats belonging to the town was kept for public inspection at the Custom-house, I applied to one of the officials of that establishment for information as to their number and tonnage. I was, however, told that the required information would take some time to obtain, and he could not undertake to furnish me with it for less than a sovereign. I then inquired if I could inspect the register myself for a few minutes, but was informed that "that document was locked up." Nothing but the golden key would unlock this treasure. Not feeling disposed to submit to an imposition of so gross a nature, I determined to endeavour to obtain the information, as near as possible, from some of the boat-owners themselves; and from them I learned that there were from 80 to 100 herring-boats then out, and that this number included those which were connected with Lowestoft, and that the average number of the men and boys employed in each boat was ten. The quantity of fish cured and sold at Yarmouth is considerably more than that brought in by these boats, as great numbers of both north and west country boats bring their fish there for sale.

The tonnage of the boats employed in fishing varies from 36 to 55 tons, and they are generally called "luggers." Most of them carry three long masts, two and sometimes three topmasts. A boat of 54 tons would cost about £550. The suit of sails would cost £78, and the nets £280. The warps and bowls for the nets would be £100, and 60 small barrels used to buoy the nets in the water, at 4s. each, would cost £12—in addition to which there would be seven warps of 120 fathoms in length, to which the nets are made fast. The greater part of the net is purchased at Bridport; but before it is used it has to undergo the process of tanning with bark. It will take about a hundred weight of "lint"—the material of which the nets are made—to make four nets. The women employed in mending the nets are called "beatsters," and each boat will afford employment in this kind of work to two women during the entire year. A great number of children and women are also constantly employed as "braiders," and in forming the meshes of the nets.

The herring fishery is by far the most important and extensive in connection with Yarmouth, and the fame of its "bloaters" is almost world-wide. The herring season usually commences about Michaelmas, and continues for about 12 or 14 weeks, the boats being almost all "made up" by the 8th or 10th of December. Great complaints are made by the owners of boats—the great majority of whom are also curers of fish—of the badness of the late season; not so much on account of the numbers of fish caught, as of the ruinously low prices at which they have been sold. Various reasons were given me as the cause of this depreciation. One of the principal causes was the prevalence of the cholera, and "the ignorance of the doctors" in prohibiting fish. "It was ridiculous," said a large owner and curer to me, while he was expatiating on the healthful and beneficial qualities of the "bloater," "to suppose that erruns hurt people; it is quite the contrary, they does 'em good. I know several people who wont eat nothing but erruns when they're poorly, and they always gets well again." Whether the faculty were really correct or not in including fish in their prohibitory diet-table, will, I suppose, for some time, remain an open question between the respective parties; the effect, however, has been most injurious to Yarmouth. "I'll give any one £500, and be glad to do it," said my friend, the advocate of the healing virtues of the herring, "who'll pay me what I'm out of pocket this season."

Another cause of complaint among the Yarmouth owners is the formidable rivalry which they have to sustain against the west-country boats, which bring their fish into the port, and, by increasing the supply, tend to reduce the prices. During the last season more than a hundred of these boats entered Yarmouth for the purpose of disposing of their fish. In consequence of the different system which is adopted in the west-country boats, as compared with those of this town, the fish are generally sold at considerably lower prices than would suit the convenience or profit of the Yarmouth people. The men in the west-country boats engaged in the herring fishery have generally a share in the boat, and they usually divide among them whatever they get. Having only the expenses of the boat to defray, they can afford, and are always anxious, to part with their fish at any price. Their nets are generally mended and repaired by themselves; they have consequently none of the expenses for labour which the Yarmouth fisherman has to bear. The boats and nets too, being their own property, are generally taken greater care of by the crews than by those of the Yarmouth boats, who are engaged upon a totally different system, which I shall presently state.

The complaints of the Yarmouth people do not, however, stop here. In addition to the decreased consumption caused by the cholera, and the increased supply of their western rivals, they have to lament an almost total cessation of demand on the part of great numbers of French boats which used formerly to visit the town in order to purchase fish. A few years since, twenty or thirty French boats used constantly to come into the port and purchase great quantities of herrings, which they were in the habit of taking back to France as the produce of their own fishing. They would, perhaps, catch a few herrings themselves, buy the rest at Yarmouth, and take them home and receive the bounty money from the French Government on the quantity which they were supposed to have caught. A French cutter is now constantly stationed in the harbour to prevent this species of smuggling from being carried on. The effect of this has been, I was informed, to reduce by £5 or £6 the price of the "last" of herrings.

I have already stated the cost of a boat, with its nets and lines, as required for the fishing trade. I shall now enter somewhat more in detail into the current expenses of the boat, and the quantity and value of the fish taken. The crew of a fishing boat consists of from ten to twelve persons, varying according to the size of the boat. They are of various grades—a master, a mate, one oarsman, one whaleman, one net ropeman, one net-stower, one yunker, and four capstan men, and sometimes a boy. The payment of the men is regulated by the quantity of fish which they catch. The master gets 16s. per last—a last consists of 13,200 herrings; the mate 10s., the oarsman and whaleman 9s., the net ropeman and net stower 6s. 6d., the yunker 4s. 6d., the capstan men from 4s. to 4s. 6d. each, and the boy about 3s., making a total of 82s. 6d. per last paid for wages to the crew. Some of the herrings were sold this season for £3 10s. and £4 5s. per last.

This, however, does not include the cost of their provisions. The boat's stores generally consist of 3 cwt. of bread, 10 nine-gallon casks of table-beer, half a firkin of butter, half a hundred weight of Dutch cheese, 1 cwt. of beef, 10lbs. of coffee, and 4 stone of sugar. The consumption of beer among a crew of ten men and a boy is usually a nine-gallon cask per day. Each boat is also provided with 10 or 12 tons of salt for the herrings, in case the boat should not be able to make Yarmouth while the fish remain sweet. In addition to the wages and provisions for the crew, there is the wear and tear of the nets. "It costs me a hundred pounds a season for mending the nets of my boats," said the individual to whom I have before alluded; "there's Mr. Dogfish, he bites 'em to pieces, and soon wears 'em up. Then there's the string for mending. 'What does that cost?' Why it would puzzle a Philadelphia lawyer to tell that. There's 45 or 46 cwt. of net, besides all the running in twine; and then there's the tanning of it before it can be used."

In addition to the expense of taking the fish, the owner has to pay a number of additional expenses before he can have them landed. Owing to the want of sufficient depth of water the fishing boats are unable to come nearer than about half a mile from the beach. The fish are consequently obliged to be brought to shore in ferry boats, rowed by a somewhat important body of men, called the beachmen (to whom I shall have occasion presently more particularly to allude), in baskets called "swills," each holding about 500 herrings. The charge made for conveying them to the beach is 10s. per last. They have then to be taken up the beach to the shore in small carts at a charge of 5s. per last, and 1s. extra for the trace horse to assist in drawing them up the loose sand. The owner of the boat has, therefore, to pay £4 2s. 6d. per last as wages to the boat's crew, and 16s. per last for the landing of the fish—making together £4 18s. 6d. per last, in addition to the cost of provisions for the men, which is about £2 per last, and the wear and tear of the nets and boats. The whole of the expenses may be taken together at about £7 per last, and when the herrings are sold for less than this price, of course the greater the quantity the men take, the greater will be the loss to the owner. It must not, however, be supposed that it is the invariable rule at Yarmouth for the fishermen to sell their herrings for a less sum than they pay to catch them. The love of gain of the people, which is almost proverbial, forbids any such rash or unfounded conclusion. A passing cloud may have darkened for a while their brightest expectations; but there are already some glimpses of returning prosperity. I had the curiosity to inquire the price of some herrings which were for sale, and was informed that it was £10 5s. per last; they were not, however, of first quality, being all "shotten." The curers have a great quantity of dried herrings on hand, which they expect to be able to dispose of at improved prices, and as many of them have been bought at very low rates, they may probably, upon making up their accounts, find that the improved value for the dried will counterbalance the depreciated prices of the fresh herrings.

Comparatively few of the persons actually employed in fishing are natives of the town. "The reason is," said a Yarmouth man to me, "it don't pay us to go out for such low prices; we can't do it for the money." By far the greater part of them are farm labourers, from various parts of the counties of Suffolk and Norfolk, principally from those portions of the county adjoining the sea coast. Immediately after the harvest they start off in search of employment to Yarmouth, and various other small ports on the coast of Norfolk; a great many of them are "Norwichers." They usually enter into an agreement with the owners to stay during the herring season. On making the agreement the men are required to state where they came from, the name and address of the person who last employed them, and the name of the last boat, if any, in which they may have sailed. These precautions are adopted, as I was informed, in order "that if any of the men are lost, or washed overboard, we may know where they came from, and send their friends word as to where they're gone to." When mishaps of this kind take place, the children or widow of the lost man receive the full share of the earnings which would have been paid to the husband or father had he been alive.

Each one of the boat's company has his peculiar duties assigned to him. The master, of course, has the entire command. The duty of the mate is to assist the master. The oarsman attends to the oars, the whaleman to the nets. The net ropeman looks after the rope to which the nets are attached. The net stower attends to the stowing of the nets, The yunker is generally employed in skudding the nets, and occasionally goes to the capstan. The duties of four capstan men are indicated by the name they bear, and the duty of the boy is to curl the warps, and make himself otherwise generally useful; one important branch of his duties consisting in serving the beer to the men.

The mode in which the herring fishing is carried on by the crew is in this manner:—Each herring net is composed of a number of meshes, or holes, of about an inch square, and is 24 yards long, and 200 meshes deep. From the mode in which the herring swims in the water, it is obvious that they would not be able to enter the meshes if they were not more than an inch in depth. The mode adopted to overcome this difficulty is that of reducing the width of the meshes by reducing the width of the net; and, consequently, increasing their depth till they hang in the form of a diamond of about one-and-a-half inch in length by half an inch in breadth. This is effected by "setting the nets," which are 24 yards each in length, upon 16 yards of rope. The net—or "lint," as it is called —is then made fast to the warp by what are called the "season ropes." About eighty or ninety of these nets are attached together for the herring fishery, making together a quantity of nets of 700 fathoms, or four-fifths of a mile in length. The quantity of net run out in the mackerel fishery exceeds 2,000 fathoms, or very nearly two and a half miles. The herrings, when caught in the meshes, seldom live more than a few minutes; if caught round the gills they die almost immediately.

The quantity of fish caught will vary, of course, considerably, according to circumstances. One person informed me that a boat in which he was employed a few years since had brought in ten lasts of herrings in four hours: and in another case that he knew, 18 lasts were brought in during the same period. "But there's not been such a catch as that this year," said he. "Sometimes we're out for a whole fortnight, and don't get so many as we can eat; and sometimes we're obliged to beg a few of our neighbours for our own eating. Last year I fished the October month out, and only took 2,800 herrings. One of the best seasons I ever had in my life was about six years sin', when we catched 43 last, and got home to Yorkshire on the 28th of October. If it's a good season, no boat ought to make less than £450 or £500." When on board, the fishermen seldom or never take off their clothes when they go to sleep; they are all ready, "booted and drawered," to jump up on deck directly, to haul in the nets if they have a sufficient take. At the latter end of the season the men, I was told, are not so good as at the beginning; they get lazy, careless, and tired, and the "take" of the boats is generally very small in consequence.

The amount paid to the men, as before stated, depends entirely upon the quantity of fish taken, without reference to the prices at which it may be sold. The masters have come to a determination to make an alteration in the system for the future, and to pay the men only for the fish they take, in proportion to the price at which it is sold. To any attempt of this kind the fishermen are most decidedly and unanimously opposed. For several seasons the plan has been attempted to be carried out, but hitherto the masters have always failed. At the commencement of the present season a similar attempt was made to induce the men to go out upon those terms, but they one and all refused. The difference between the parties at one time threatened to assume a rather formidable character; the owners, however, gave way "for this time," with a mental reservation that next season there should be some alteration. The earnings of the men during the present season have been generally somewhat above the average. The quantity of herrings taken has ranged from twenty-five to forty lasts for each boat: the earnings of the men would therefore range from £6 to £9 for the lowest class or capstan men—from £8 to £13 for the "stowers and ropemen"—and from £11 to £18 for the "oarsmen and whalemen;" the mates receive from £12 to £20, and the masters from £20 to £32 for the three months. There may be some who have earned a less—some probably a larger—amount than that stated above. I have met with several labourers who have returned from the fishing, and in no case have I found that their earnings were under £5 for the season (about three months) independently of their provisions. The north-country boats which come into Yarmouth do not, generally speaking, make so much as the Yarmouth boats, as they almost invariably make for port on the Saturday, where they remain over the Sunday —few of them being willing to carry on their operations on that day.

At the conclusion of the herring season, the mackerel fishing commences. The usual period for commencing is about Christmas, and it generally lasts till April. Many of the Yarmouth boats go as far as Plymouth to look after the mackerel. When they take them they are usually sold at the nearest port, whence they are conveyed by railway or other conveyance to the London markets. In the case of the mackerel fisheries, the men are all paid by the share. The fish are usually sold at public auction; a portion of the produce of the sale is reserved for the nets, another portion for the boat, and, after deducting the cost of the victuals and other expenses, the remainder is divided among the men, in proportions agreed upon.

The sole and turbot fishing is carried on almost the whole of the year. The men employed in this department are paid by the week. The master gets 12s. a week, and a shilling in the pound on what the fish realize; the men get from 14s. to 16s. per week; and the boys from 2s. 6d. to 5s. The vessels employed in this kind of fishing are generally cutter-rigged craft. They visit Holland, the Humber, and the Silver Pit for soles; and many of them carry large quantities of ice on board, in which the fish taken are kept if they are not able to make land soon.

The Yarmouth fishermen are generally considered to be very hard and close in their dealings. I have heard it frequently stated that "the Yarmouth people count the scales on their herrings," and that "if one of the men loses a scale off, he gets the sack from his master." The saying "dog eat dog," is invariably applied to the dealings of a Yorkshireman and Yarmouth man with each other. "The Yorkshireman," they say, "bites hard; but the Yarmouth man bites harder." The fact of their close-fistedness in money matters may, perhaps, have something to do with the character which they generally bear for "pluck." "They are the pluckiest set of fellows," said one of them to me, "that's known anywheres; they're like terriers. Fight! Aye, they'll fight a mill-post. They're the terror of the publicans; in Norwich they'd as soon see as many devils come in as Yarmouth folks." I was also informed that at St. Ive's, when the people heard that a Yarmouth boat was in the harbour, they instantly closed the public-houses, apprehensive lest they should be favoured with a visit. "Wherever they go," said one of the publicans of Yarmouth to me, "they make everybody else in the house uncomfortable, and won't spend any money neither."

From the men engaged in fishing I shall now proceed to another branch of employment in connection with the herring trade of the town—that is, the curing of the herrings. There are two things of which the Yarmouth man is proud, perhaps justly so—his boats and his bloaters. "There are no ships in the world," said one of them to me, "that can come up at all to the Yarmouth build; they stand higher at Lloyd's than any others, they'll stow more, sail quicker, and stand the longest." In praise of his "bloaters" the Yarmouth man will often wax eloquent and even poetical. "The errun, sir," said my friend who was so strong an advocate for the restorative qualities of herrings, "is a cold water fish. The Yarmouth fish is a better sort of fish than's caught anywhere else; all depends on the quality of 'em, and what they lay upon; and the season, too, is half the thing. Why, sir, the October erruns, caught on the Brown Bank—they are as different as different from any other speshus of fish. We like the short, thick, shiny, bright, pulky erruns, Them erruns you get in Midsummer time ain't got no roes; there's no doing nothing with 'em; you can only cure 'em as inferior sorts of bloaters. The errun is always better when the water's cold. Why, do all you can, you can't make a Yorkshire errun a Yarmouth one: they haven't got the taste nor yet the flavour of 'em. You know them there great Scotch erruns that's caught in the summer time. Well, they go out to the Mediterranean before us. Well, our erruns go after 'em, and soon knocks 'em out of the markets there. They supersedes the Scotch wheresomever they goes. Now, take a barrel of these Scotch erruns—I don't care how treated—and put a bloater by the side of 'em. Why, lor'! there's as much difference between 'em as—what? Aye, as between a primrose and muck. Only put your nose to 'em you can smell 'em at once; they have a nasty rank smell; and then when you open 'em the bone is as coarse as coarse; but open one of our little pulky ones, and you'll find it as fine as silk. You won't see one Scotch errun out of a hundred but 'll always be as black as a coal at the back bone; but the little bloater is as red as a cherry and as sweet as a rose." Such are a few of the transcendent qualities of this excellent fish, the Yarmouth herring, as stated by one of the corpulent and enthusiastic curers of Yarmouth. The reader will no doubt feel some anxiety, after so glowing a description, to hear something of the process of curing, and the mode by which the men of Yarmouth are enabled so successfully to distance their competitors in the herring trade.

We will accordingly accompany our freind to his large curing establishment, and, premising that the fish are all landed, and stowed in the sheds, we will hear in his own words the mode adopted in the curing of herrings. The first part of the building which we will visit is a large room, the floor of which is sloping at each end, and paved with bricks. In the centre of the room, and at the foot of the slope, a drain is formed for carrying off any refuse matter that may flow into it. Upon these sloping floors the herrings are laid, preparatory to undergoing the first process. Our friend will now describe the process of salting:—

"You know, sir, there are two kinds of erruns that we make; one is the bloater, the other is the dried uns. The dried uns we send to the Mediterranean, to Venice, Leghorn, Tuscany, and other places, where there's many Catholics. The erruns we use for this are the ones that comes in late, when the boat is out a long time, and they are obliged to salt 'em aboard. When they come in here we lay 'em upon these here sloping floors and bury 'em in salt, and you'd be surprised if you were to see how they sweats. Lor' bless you, we can't do nothing with 'em till we've sweated all the blood out of 'em. Sometimes it takes ten days or a fortnight to get it all out. When they've sweated enough I keep nine old women and five men—we call 'em 'rivers'—who hang 'em on the 'spits' about 20 on a spit: they open the gills with their fingers, and push the spit through 'em; then they're hung up to dry in the drying-houses." The spit is merely a stick of about a foot in length. The drying-houses are large spacious buildings of about 20 feet in height. In most cases the floor is three or four feet below the surface of the ground outside. The reason of their being sunk was in order to gain as much room as possible, the corporation of Yarmouth having forbidden the erection of drying-rooms above the height of twenty feet, as they would prevent the view of the sea from most of the houses. Some of these drying-houses have from seven to fourteen compartments, which are called "rooms." The house which I visited was a ten-roomed house. The rooms are formed by beams or "balks" laid across the house, at distances of about feet from each other, and about eight feet from the ground. Resting upon these "balks," and reaching to the top of the building, are a number of racks about a foot apart, upon which the ends of the spits with the herrings upon them are supported. Each room will contain about fifteen tiers of herrings, one above the other. As the spits are placed very close to each other, each room will contain about a last or 13,200 herrings. Upon the floor and beneath the herrings large oak logs are kept constantly burning, the air is excluded as much as possible, and the herrings are gradually smoked and dried. The dried herrings for exportation are generally smoked for ten days or a fortnight. When sufficiently dried they are taken down, packed in barrels, and in this state are exported.

But hitherto we have only witnessed the process of curing the dried herrings for exportation. The pride of the Yarmouth man—the bloater—is seldom or never exported; they are entirely for home consumption. "The bloaters take a very small time in preparing. They come in, for instance," said my friend, "in the morning; they're hung up over the fire a night; they're lightly salted for home at once; and in four or five hours they are packed and sent away; some of them hang all night, but less than that is enough for 'em." A number of men were engaged in packing the herrings in hampers for the London markets. Opening one of the hampers, "Them bloaters that they're packing," said the master, "some of 'em was in the water 24 hours ago; they are now off for London." He then took one of the herrings out of the basket to show me. "Look at it" said he; "it's as mellow as a pear; its eyes is as bright as a diamond; it's gills is as fresh as fresh: why it's almost alive. We don't make 'em very salt, as they're not intended to keep long. The most time that they'll keep good is about ten days or a fortnight, but I never like 'em after three or four days; they lose their flavour after that, and gets crumbly, and falls to pieces when briled." Some of the herrings, when taken, are broken and damaged by the nets and the rough usage which they get in landing. Before the herrings are sent away to market, they have to be sorted. The broken ones are thrown aside as "plucks," and when sent to market in barrels they are marked with the letter P, and sold accordingly.

There are from two to three hundred persons male and female, employed in curing the herrings. The women earn from 5s. to 7s. per week, the men from 12s. to 15s., according to the nature of their employment. About 100 coopers are also pretty constantly employed in making barrels for the exportation of the fish when dried and cured.

Having given some account of the fisheries, the fishermen, and the curers, I must not omit to notice one very important body of men in connection with Yarmouth, known as the "beachmen." The life of a beachman is one of constant excitement, toil, and danger. I have already stated that, owing to the want of sufficient depth of water, the fishing boats are not able to come near enough to the beach to land their fish. One of the duties of the beachmen is to bring the fish ashore in what are called "ferry boats;"and another very important part of their duty consists in affording assistance, in case of distress, to the numerous vessels which are constantly getting aground on the Cross Sands and at Scroby.

The beachmen are formed into companies of about twenty each, one of whom is called the captain, and they divide equally among them the proceeds of whatever they make. For bringing the herrings ashore the charge is 10s. per last; an account is kept of the quantity they bring ashore, and at the end of the season they are paid by their employers. They do not get paid as the work is done, but have to wait till the close of the season—and in some cases, like most people who are in the habit of giving credit, they have to divide a back debt. "I think," said one of these beachmen, "that there will be some trouble in getting our money this year from all of 'em, the fish has sold at such low prices, and some of the masters won't be able to pay us." In a good season the company will divide from £200 to £300 among them.

The herring season is considered by them to be their harvest. "The mackerel work is poor work," said one of them; "you may consider yourself well off if you can get 5s. or 6s. a week." Their charge for bringing the mackerel ashore is a shilling per hundred, and they are paid for their work at the end of each week.

When the herring and mackerel seasons are over, the beachmen are comparatively idle, their chief business then being to look after wrecks, and sometimes they earn an extra shilling in taking people out on the water for pleasure. One of the men with whom I entered into conversation stated that "after the season is over we have nothing to do but pleasuring; sometimes they make special constables of us at the time of the races. When we ain't employed at that, we go hovelling and knocking about to see what we can do. There ain't been many wrecks about lately. We have always one of our company on the look out, and he gives the signal when there is anything. We've been out all to-day swiping after an anchor dropped by one of the fishing-boats, but we couldn't find it. It won't give us much when we get it. The Cross Sands, where there are the most wrecks, is about seven miles from here. Scroby is about two and a-half. There's thousands of folk as never tells the tale of that place; they don't want much to go to pieces when they once gets on there. When we go to a wreck, if the vessel is stranded, we get one-fifth for ourselves, and the owner gets four-fifths. When there's a wreck, the people of course always gives us the most valuable things first, as they are naturally anxious to save them. The preventives keep a very sharp look out after us, and so do the insurance people. You can hardly get a bit of rope even of the length of your finger here. Sometimes when we get a cask of liquor we broach it. We don't think there's any harm in that. The money that we get at the end of the herring season is all eat up before we get it. We are obliged to go in debt for what we want, for they won't let us draw anything on account; and then there's a great deal of 'sleight' (wear) upon the men's clothes. Here's a pair of shoes I've got on; I've only had 'em six weeks, and now they want soling and heeling. Well, then there's the boot stockings (large worsted stockings, which reach above the knee); they cost 2s. 6d. a pair. They chafe a great deal with the sand and wet, and soon wears out. Then the trowsers, they're fustian, and cost about six or seven shillings a pair. The blue flannel slops, they costs about 7s. a piece, but they're very warm; and then there's the Guernsey frocks that goes over the slop, they're 7s. and 8s. each; and then there's the oily trowsers and oily frock that goes over 'em all to keep the wet out, they're 10s. or 11s. each; the sou'-wester would be about a crown. When we are bringing the fish ashore, the surf runs so high and so strong that it often washes the fish out of the boats, and we are almost always wet head over ears; we have sometimes three and four fresh suits on in a day: if we haven't got but one suit, of course we are obliged to keep on the wet one. I pay £5 a year rent for my house, and that's about the price paid by all the beachmen, though the rent is mostly paid by the week. We are obliged to live as near as we can to the shore, as we don't know when we may be wanted. I used to live in a house close by the shore, but they have pulled them all down lately, and they won't build any more small houses unless they touch the rates (are rateable). Some of us are obliged to keep watch about the beach all night, for if there was to be anything start up for us to do we couldn't collect all our men so quick as we ought, and unless we were all to be here when the boat pushed off, we shouldn't get any share of what the boat got. Unless we can touch the boat, we don't have any share. Sometimes, when the men are not able to get in the boat, they'll run after it up to their waists in the water to touch it, and if they can do that they get their share. I once got £50 for just touching the boat in that way. If one of the company is hurt in the boat, he gets his full share just the same; and if he is sick, or unable to work, he has a share allowed to him which lasts as long as he is sick, and when they 'turn up' we 'shoots' a little among ourselves to bury him, or if there's a widow, we give it to her. If the man belonged to a club, we 'shoot' just the same, and raise enough, and over, to bury him. I have belonged to a club for 31 years, and have never had but two months' money from it. I pay 1s. 10d. a month—that is, 1s. 6d. for the box, and 4d. for beer. If a man is catched groggy at the club, or caught swearing, he is fined a shilling. There's another club for beachmen and seamen, where they pay 2s. 6d. a month, and if you are cast away or lose your clothes, fresh clothes are given, and you are sent home free of all expense. These are called the 'half-crown' clubs; the members of the club have a small medal, which is tied round their necks by a piece of ribbon; it is sewed up in a piece of cloth, and is always worn under the shirt, next to the skin. So if a man gets cast away in Cornwall, or anywhere, he has only got to show his medal to the club there, and they will send him home, and give him what he wants. Then there's the Muster-roll Club; every man who goes aboard a ship is obliged to pay to that a shilling a month—it is stopped out of his pay. It is in connection with the Merchant Seamen's Fund." "Ah, I subscribed to that club for a long time," said an old, weather-beaten looking man, who belonged to the same company of beachmen; "and what do you think I got when I was cast away on Greenland, and was there for six weeks? Why, I got half-a-crown."

From all that I have seen of the beachmen of Yarmouth, they appear to be comparatively well off. They are all strong and hearty-looking men, inured to danger, and appear capable of undergoing almost any amount of hardship. There is no weather so rough or stormy that it will prevent the beachmen pushing off to the assistance of a vessel in distress. That their impelling motive is gain there can be no doubt, and to obtain their end they will encounter dangers from which many of the most hardy and experienced mariners would shrink. It not unfrequently happens that after rowing in the roughest weather for several miles to a wreck, cheered with the bright vision of the large amount of salvage they will have to divide, they find to their great disappointment, that it is but a collier or corn-laden vessel, with little or none of the more valuable cargo which best repays the adventurous beachmen, as they are paid only according to the value, not the quantity, of their salvage.

As far as the beachmen are concerned, there is no doubt but that they manage, with one thing or another, to do pretty well all the year round. Those who are actually employed in the fishing boats return to their homes at the end of the season, with the amount of their earnings; but many of them soon contrive to run through them. When their funds are exhausted, they apply to the farmers for work, and if not able to obtain it, they become burdens upon the different parishes till the farm-work revives. After harvest they again betake themselves, like other amphibious creatures, to the sea, and again go through the same routine of fishing, farming, and pauperism.

AGRICULTURE AND THE RURAL POPULATION ABROAD.

FRANCE.—No. VI.

THE VALLEY OF THE LOIRE—TOURS TO NANTES.

[FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.]

In this, the last communication which will be dated from the sunny land of the Loire, I wish to guard against any misconception as to my descriptions of the general state of tillage—so far at least as surface appearances go—which characterises the beautiful and fertile country through which I have just travelled. I have described the ordinary cultivation of the soil as being ineffective and slovenly. In some cases —where, for example, huge crops of weeds abound amid clover or potatoes—neglect and carelessness are obvious. Such, however, is very far from being the general rule. A vast amount of patient hand labour is almost uniformly bestowed upon the soil. The garden-like aspect of many tracts of land is striking; but the tools employed, and the system pursued, are not the less inefficient, and the resources of the land—notwithstanding its surface neatness of appearance—are not the less inadequately developed. The soil never appears to be stirred beyond a depth of some six inches. A shallow top stratum performs all the real work. The fertile loam beneath is left undisturbed by subsoil ploughing, and unimproved by draining tiles. Thus, then, it is that—despite all its skin-deep beauty of culture, pleasing to the eye as the display certainly is—I have ventured to pronounce as being inefficiently and ignorantly cultivated the smiling districts of the Orleanois, Touraine, and Anjou.

Proceeding from Tours to Saumur, you pass scores of such villages as I have described in a previous communication, scooped out in the soft limestone rock. Sometimes there occurs a solitary habitation by the wayside; sometimes a regular street dots, with its dark rows of doors and windows, the whity-brown face of the cliff. The country, too, improves in some degree in picturesqueness. The valley contracts, and flings bold rolling hillocks, masses of Indian-corn and vines, down to the narrow stripes of meadow which bound the water's edge. Gradually you observe a change in the vegetation which borders the dusty highway. Waving acacia-edges, surmounted by feathery trees of the same graceful wood, begin to appear—the vine grows more luxuriantly and more stoutly, flinging out its tendrils along horizontal poles, and sometimes climbing and hanging from rich rows of plum, peach, and apple trees. Another southern characteristic which strikes the eye is the use of oxen, harnessed simply with the primitive yoke, to draw the teeming harvest wains. These creatures are of a small but finely-formed and graceful breed, with peculiarly beautiful heads, the eye quick, full, and intelligent, the muzzle black, with a fawn-coloured rim above the lips. The pace of these animals is, of course, very slow, but they are as docile and obedient to their master's voice as horses, stopping, moving on, and proceeding from side to side, at a word. They are well fed and kept, their sleek skins glancing from the curry-comb, and, so far as I saw, they are driven without goads. Towards Angers, where heavy loads of slate and stone were being conveyed from the neighbouring quarries, I found four small oxen frequently attached to a cart, with a single horse as a leader in front. In all cases, however, the yoke attached to the horns of the former was the only species of harness used.

FRANCE.—No. VII.

UPPER LA VENDEE.

La Vendée—for ever famous from the succession of desperate campaigns carried on by its simple and enthusiastic peasantry, under their hereditary leaders, against the overwhelming forces of the Convention—is, geographically considered, a small slice of the west of France, south of Nantes, bordered on one hand for the most part by the winding course of the Sevre; and on the other, stretching in a dreary succession of swamps, sand-hills, and salt marshes, to the Atlantic. The country, is locally mapped out into three—for the most part blending and imperfectly distinguished—parts; viz., the *Marais*, the *Bocage*, and the *Plaine*. The first is the stripe of country lying along the coast—a dismal succession of sand-hills, heaths, bogs, and saltwater ponds, chequered here and there by stripes of green pasture-land. The Bocage rises higher above the level of the ocean—sprawling hedges and sturdy clumps of trees forming tangled coppice woods—and weedy thickets intermingled with rushy heaths, bleak knolls of grave and rock, and corn and pasture patches nestling in the hollows. On the Plaine, corn and vines are cultivated in great abundance; but the face of the country still bears the features distinguishing it further seaward. Hedges, timber clumps, green matted expanses of coppice, and rough, bristling wastes of heath, furze, and thorn bushes, alternate with rich corn fields, smiling vineyards, and interminable tracts devoted to the culture of whole jungles of big, overgrown cabbages; and these last characteristics, as well as the general appearance of the farm-steadings and villages, and the primitive and rough but far from rude manners of the people, extend inland beyond the technical and topographical boundaries of La Vendée. Thus considerable portions of the modern departments of Loire-et-Maine and Les Deux Sevres are morally and physically, though not geographically, portions of Vendée.

Proceeding southward, I chose the upper route through the frontiers of the Plaine, in preference to the road amid a wilder and more thinly-peopled country nearer the sea. Starting from Nantes, I made my way by one of the recently-constructed roads, run by the late ex-King through the previously almost inaccessible portion of Vendée which lies between the great old highways from Nantes to Bordeaux, and from Tours to Poitiers. Very soon after leaving the interminable suburbs of the great Western port behind, one begins to get an inkling of the characteristics of Vendée. In the first place, the new white look of the villages contrasts with the grim old trees, the ancient crumbling hedges, and the rotten old earthern mounds which frequently line the way; for here was the principal scene of the well-fought Vendéan war. Hardly a hamlet but what was successively the head-quarters of Kleber's disciplined troops, or of Larochejacquelin's raw but fiery levies, and hardly a village street which escaped the torch amid the fierce warfare waged around them. You pass town after town—small dull rural places, every stone of which has been piled within the present century, yet not unfrequently bearing names famous in old French story. Here and there, too, a cross, or a sculptured block of granite, preserves a memorial of some fierce and bloody skirmish fought between the grim garrison of Mayence and the guerilla marksmen of

La Vendée, swooping down in sudden onset, from bristling thicket and by unsuspected by-ways, upon their bewildered opponents. The scene of one of the principal actions of these cruel wars, near the village of Tourfon, is marked by a high grey mouldering tower, standing in a lonely spot where four roads meet.

All around, as you track the dreary extent of road, running like an arrow up hill and down dale for leagues ahead, you behold a vast ocean of fair undulating country, fading away into purple sweeps and mingling with the far horizon. At first you imagine that you are entering a vast expanse of forest land, but you speedily perceive that the heavily-timbered appearance of the middle and extreme distances arises from their being a continuation of the same thickly-hedged and tree-girted fields through which lies your road. Properly speaking, there are no forests in Vendée, although perhaps fully a third of the country consists of wood—vast quickset hedges, thickly studded with oak and elm trees, every now and then bursting out into straggling clumps, which intrude upon furzy knolls and rough rank patches of meadow land. The smallness of the fields is remarkably uniform. You may travel for a league and find not half-a-dozen bigger than an ordinary sized garden, while very frequently the actual expanse of ground seems to be not unequally divided between the field and its woodland fences. From these hedges and the numerous rows of trees which form part of them, the people derive their fuel. Great, therefore, as is the waste of arable or pasture land, it is, under present circumstances, a necessary one. Winding hither and thither, crossing and recrossing each other in endless labyrinths amid hedges and hedge-rows, run mazes of devious cross-country ways, leading from farm to farm and from hamlet to hamlet. Awfully rough, rutty, and sometimes precipitous, these by-roads are frequently perfect tunnels, enclosed between tangled lines of hedges and pollard oaks, meeting over-head, and shutting out wind and sun. The fantastic shapes of the small fields, the strange nooks and corners with which they abound, from the perfectly wanton courses of the hedges, strike one forcibly. In one instance I observed a patch of ploughed land, some fifty yards long, and not more than two yards broad. The furrows had, at the expense, I should think, of some unnecessary labour, been drawn across instead of along this stripe of ground, and the consequence was that it bore a dismal resemblance to a long row of newly made graves. The quantity of what appeared to be waste land, overgrown with furze or broom, at first astonished me, but I soon observed that the plant was regularly sown, along the old furrow marks. On inquiry, I found that the planting of broom was an approved Vendéan method of bringing land into heart after a series of more or less exhausting white crops. The broom is first sown with oats between the rows, and the crop of the latter removed; the furze is regularly attended to, hoed, and prevented from growing too thickly. This strange harvest is allowed to remain on the land for an interval of from three to six years, the cuttings and thinnings being used for lighting fires and for ovens. Sometimes, in severe winters, the cattle are fed upon the tops of the plants cut small. In Brittany, much the same system is pursued. Worn land is there planted with thorns as well as furze, and the former, well chopped up and mixed with green food, is eagerly devoured by both cows and horses. When weeds and wild grass begin to appear between the drills of furze, cattle are turned into the field to browse and to manure the land. After a course of this broom-fallow, I am informed that the most luxuriant wheat crops are produced.

An article of produce to which great importance seems to be attached, and to the raising of which even more land is devoted than that appropriated to vines and corn, is a species of huge, gaunt, blue-stemmed cabbage. The largest fields are frequently occupied by jungles of this esculent, which is planted in regular drills. The principal portions of the plant, its stem and outer leaves, are used for fattening cattle; but the heart affords a sweet vegetable morsel greatly in vogue, in company with lumps of pork cut from the lean and leggy pigs which abound, for making the winter soup. Turnips are sparingly cultivated, and almost exclusively for cattle and sheep. A strange breed of the latter may, by-the-bye, be seen hereabouts, browsing on the ridgy banks of the cross lanes, or amid the knolls of furze and heather—a breed, indeed, which no agricultural show that I remember has ever produced a specimen of. The creatures are gaunt black sheep, with coarse wool, and furnished with long white tails, a species of finish which gives them a sufficiently out-of-the-way eccentric appearance. A considerable number of goats are reared along with the sheep, and all the farm steadings are prolific in the matter of poultry, especially geese.

During the drive from Nantes to Bressuire (the dismal little country town from whence I write these lines)—a distance of about sixty weary miles in a cross-country diligence—I did not see a gentleman's house, or a single vehicle which could at all pass muster as a gentleman's equipage. Ruined castles we passed in unusual numbers—many of them partially connected with dirty farmyards; but of modern, or even inhabited, chateaux there were none. In the villages there was the same want of a higher and more refined social element than that of the ordinary peasantry, or the mechanics and small tradesmen dependent upon them. In the outskirts of pleasant little market towns you saw none of the neat villas or stately manor-houses which would encompass such places in England. Some three or four straggling streets, of blank white houses, the largest of them a sprawling hotel, a few paltry shops, and a café almost entirely taken up by a massive billiard-table—a bare open market place roughly paved, overlooked perhaps by the mouldering towers of an old gothic church, and a couple of gaunt mansions with their green outside shutters closely drawn—such form the staple materials of most of the small country towns, in this part of France as well as in others. You see marvellously little distinction of rank among the people. No neighbouring magnate rattles through the lonely streets in the well-known carriage of the Hall or the Grange, graciously receiving the ready homage of the townspeople. No retired man of business or bustling land agent, with his smart gig and cob—no half-pay officer goes gossipping from house to house, or from shop to shop. There is no banker's lady to lead the local fashions—no doctor setting off upon his well-worked nag for long country rounds—no assemblage, if it be market day, of stout full-fed farmers, lounging, booted and spurred, round the Red Lion or the Plough. Working men in blouses, women of the same rank in the peasant head-dress of the country, and here and there a nondescript personage in a cap and shooting jacket, who generally turns up at the scantily attended table d'hôte at dinner time—such are the items which make up the mass of the visible population. You hardly see an individual who does not appear to have been born and bred upon the spot, and to have no ideas and no desires beyond it. Left entirely to themselves, the people have vegetated in these dull streets from generation to generation, and, though clustered together in a quasi town—perhaps with octroi and mairie, a withered tree of liberty, and billiard tables by the half-dozen—the population is as essentially rural as though scattered in long farms, unvisited, except on rent-day, by either landlord or agent. It often happens that a large landed proprietor has not even a house upon his ground. He lets the land, receives his rent, and spends it in Paris or one of the large towns, leaving his tenants to go on cultivating the ground in the jog-trot style of their fathers and their grandfathers before them. The French, in fact, have no notion of what we understand by the life of a country gentleman. A proprietor may pay a sporting visit to his land when partridge and quail are to be shot; but as to taking up his abode *au fond de ses terres*, mingling in what we would call country business, looking after the proceedings of his tenants, becoming learned, in an amateur way, in things bucolic, in all the varieties of stock and all the qualities of scientific manures—a life, a character, and a social position of this sort, would be in vain sought for in the rural districts of France. Indeed the system of having all the judicial and official business of the department managed by paid and responsible officers appointed by the government, would of itself go far to create the wide difference which exists between the framework of English and of French rural society. As there is no French country gentleman, in our acceptation of the term, so there is no French gentleman farmer. Large tracts of land are frequently occupied by persons who, in education, intelligence, and habits of life are not a whit above the small-proprietor class around them, and from which they have probably sprung. Thus, throughout great expanses of country, a low, flat social level prevails, extending its influence over all such villages and small towns as are not the seats of some particular disturbing influence—the growth, for example, of some industry not connected with or immediately dependent upon land, or possessing local peculiarities producing a sufficient influx of strangers to affect the original social elements of the place. The style of manners at the tables d'hôte of country inns is sometimes curiously significant. Perfectly nationally polite, the guests exhibit an uncouth ignorance of the ordinary conventional observances and etiquette of the table. Dining with the hat or cap on is in some places almost universal; while I have again and again seen very civil and excellently intentioned people, instead of making use of the ordinary trencher implements, produce from their pockets clasp knives, with which they cut their meat, and, placing it in lumps upon huge hunches of bread, make their meal in perfect farm-yard or cabaret style.

I have mentioned the ruined castles, more or less connected with farm steadings, which are not uncommon in Upper Vendée and the adjoining district. One of these is said by tradition to have been a favourite residence of a feudal tyrant of the fifteenth century, whose sobriquet of "Barbe Bleu" is immortalised in our own nursery literature—and which, though applied in our story to a wide-trousered and turbaned despot of the East, belonged in real historic truth to Baron Gilles de Retz, the Lord of Laval, a feudal manor, the ruins of whose donjon-keep still crown an eminence of the Loire. It is no traditional memory, however, of the blue chamber, or of the key which not the united labours of Fatima and Sister Ann could clear from the tell-tale stain, which keeps awake the foul remembrance of Bluebeard in the minds of the peasantry of the Loire and La Vendée. The Baron, it appears, kept a necromancer and astrologer, and having gradually grown old in his iniquities, applied to this family adviser to recommend him a method by which he could grow young again, and so commit all his sins pleasantly over again. The horried prescription of the seer was a bath of infant's blood. Not a whit appalled, however, by the ingredient, the baron set all his feudal power to work to obtain it, and children were constantly spirited away, by himself or his agents, to one of his strong castles, where he could conveniently work his wicked will. This, the crowning act of the baron's tyrannies, at length caused his cup to run over. His vassals leagued together, stormed his castles, and delivered their master up to his feudal superior, the Duke of Brittany. Bluebeard was accordingly tried, condemned, and burned at Nantes, in the first half of the fifteenth century. This story, which reads like a mere nightmare tradition, is well-authenticated. The records of this strange trial, with the full depositions of the witnesses, may yet be read in quaint old monkish Latin, in the archives of the prefecture at Nantes. Bluebeard's castle of Tiffanges is now one of those converted into an agricultural stronghold. Its embattled courts are well-dyked corn fields, and through the ancient spiral staircases you ascend to vaulted granaries and groined and arched hay-lofts. Further on, in the vicinity of Bressuire, are several old churches turned to the like purpose. One of these, a good specimen of pointed gothic, has been bricked so as to divide it into several compartments for the convenience of its tenants—the neighbouring farmers. Sometimes, amid ruins, lay or ecclesiastic, you find modern cottages, built with the old stone, and, clustering beneath tower and battlements, the wattled and thatched roofs of cart-sheds, perched upon the fragments of ancient gothic arches; and you see masses of stored hay and straw bulging out from pointed and mullionned windows. Many of these castles were dismantled by Richelieu—the churches generally date their profanation from the great revolution.

A ramble round Bressuire soon satisfied me as to the causes which enabled the Vendean peasantry to hold out so long against, and indeed fairly and completely to beat so often, the disciplined forces of the Republic. The wonder is how, in such a country, regular troops could have acted at all. Leave the high road and plunge into the lane-maze which traverses the whole face of the land, and you will speedily become aware of its remarkable characteristics. The country seems to have been tumbled about like the irregular jumping waves of a chopping sea. It is a perfect jumble of ups-and-downs, heights and hollows, knolls and dales, narrow glens, steep rocky banks—here a deep scaur cut in the face of a declivity—there the ground sloping on all sides, up from the bottom of a dry basin. You can seldom see more than a score of yards before you, and you are frequently perfectly shaded in by thick foliage, or, making your way from path to path, you have to push through jungles of furze, coppice-wood, and briar. The roads are generally some four or six feet beneath the surface level, having been gradually worn down by the action of the weather. In many cases, the strata of rock upon which the top loam and gravel rest, have been laid bare, and the road has then exactly the appearance of the bed of a Highland torrent. The principal timber growth is oak; the tree, however, being usually of that low scrubby species which spreads about the top of a short trunk, without branching high into the air. All sorts of hard wood, however, abound; now lining the path, now spreading into masses of luxuriant wood, and affording, as may well be conceived, a succession of delightfully fresh sylvan glimpses. The height and density of the hedges are immense, and it is curious to see, mingling with the quickset, the feathery branches of the southern acacia and the purple green of northern heather and lady fern. In a country so well provided with corn, game is very abundant; you continually hear the whirr of the partridge covey, and hares and rabbits are constantly whisking past you from bush to bush. Thus you may wander for miles, hardly seeing a soul amid this green wilderness of hedge and meadow, wood and corn land—now crossing the bright shining path where the sun pours in upon the summit of an unsheltered knoll—now plunging into the dark foliage at the bottom of a bosky dell—sometimes climbing up shelving banks of gravel and rock—anon forcing your way through forests of furze thorns, lady fern, and heather. Occasionally you will hear the clink of distant hammers, and find that it proceeds from small quarries where labouring men, crouching beneath the shade of sloping platforms of straw and branches, are drilling holes in the granite for the blast, or shaping the blocks shivered from the mass. These men work by the piece, and earn from 30 sous to 2½ francs. Looking through the hedges at the fields one cannot help thinking that the granite quarriers might advantageously bring their tools into the stubble land, and set to work to remove the masses of stone which so often interfere with the action of the plough and the productiveness of the field. These granite lumps, which a day's labour would split up and carry away, are, however, left in tranquil possession amid the corn—the furrows circling round them showing how much a matter of course their existence in such situations is deemed by the peasantry. Ploughs and harrows are, as might be expected, rough and rude in the extreme. Some of the former are made entirely of wood. The latter are frequently huge triangular frameworks, measuring ten or twelve feet from the apex to the base, with a full foot between each of the teeth. They are often dragged upright along the road to the field which is to be harrowed, one man holding the machine in its vertical position while another drives the team. Almost without exception, all farm work here is performed by oxen, and even cows may occasionally be seen bearing the yoke. In ploughing, four, and even six, animals are used—in the latter case with three men to manage the turn-out, one between the stilts, the others goading on the oxen. The breed is a larger one than that seen upon the Loire, and the animals are hardly so well kept or docile. They are set to work at two years of age, and killed for the butcher at seven or eight, after having undergone a course of training admirably adapted for making stringy tough beef. As a great part of the work of these oxen is upon the hard highway, they are regularly shod upon the outside hemisphere of each hoof, the portion of the foot which is apt most rapidly to wear. Beside every farrier's shop stands a formidable-looking frame-work machine, in which the animals are pinioned while the operation is being performed; for oxen are by no means so docile under the process has horses. I saw a fine young ox shod for the first time. He would have resented the indignity with great energy had he been permitted, but his persecutors were too knowing for him. First he was inducted into the strong wooden framework in question, consisting of four upright, and numerous horizontal bars. His head having been made fast to a vertical block, a couple of broad strong girths were passed beneath him, and attached to a lateral roller pierced with holes like a windlass, and worked with small handspikes. A couple of twists of this machine, and the ox, bellowing and kicking, was lifted off his legs. Once fairly suspended, however, the poor brute became quiet enough, trembling excessively, and submitted with good grace to have his hoofs bound to the four corners of the machine with as many plies of rope as would have tethered an elephant. The shoes were thin plates of iron, fitting the outer half of the hoof. They were nailed on without any paring or scraping whatever, the creature swerving and groaning at each blow of the hammer. The shoe attached, the plate was fitted to the hoof by the simple process of hammering, an operation which appeared to distress the patient more than any other part of the proceeding, and, the whole process at length over, he scuttled off, apparently anything but gratified with his new *chaussure.* The carts which these oxen draw are very rude and clumsy. One stout piece of timber forms at once the pole and the bottom of the vehicle, the rough upper frame-work projecting at each side over the wheels.

A Vendéan farm-house is, in general, about as rude and primitive an agricultural establishment as one would wish to see. The buildings are often erected upon unequal and broken ground, so that the eaves of one portion of the structure are about on a level with the foundations of another. The approaches are often all but inaccessible for any other vehicle than the strong oxen-drawn cart, sloughs of mud and ledges of rock alternating as you approach the outskirts of the establishment. Let the ground, however, be as broken as it may, a level space is always found or made for the dunghill, which is sure to stretch from the kitchen window to the stable-door—one putrid mass of black filth, worse, if possible, than the manure heaps which clog the Norman farm-yards. On this delectable area some half dozen pigs are pretty sure to be routing, and the worst of the matter is, that the dunghill always seems overflowing its originally-appointed limit, straggling away into remote corners, invading cart-sheds, stables, and outhouses of all descriptions. "The dunghills are bad enough now," I was informed; "but they are ten times more offensive and more detrimental to health later in the season, when they are being stirred up and removed to manure the fields." As may be conceived, the general style of the buildings is rough, bristling, and certainly very picturesque. Thatch-wattles, and tiles laid three or four deep, alternate as materials for roofs, which present some half dozen different slopes in a single range of building. Sometimes, but not often, a strip of garden ground is fenced in by a loosely piled low wall, the patch producing kitchen herbs, and sometimes a few staring, scentless flowers. Set such a picture as I have sketched—a brown-hued crumbling-looking mass of building, forming a broken irregular square—in a frame of green knolls, clothed in oak and magnificent walnut trees, the whole vicinity strewn with worn-out ploughs, invalided carts, and overrun with pigs, ducks, and geese, grunting and quacking amid the debris of mud and trampled litter, and you have a fair picture of a good-sized Vendéan farm establishment.

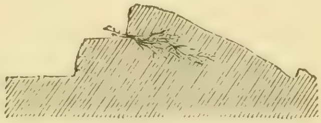
The people, as it strikes me, are a better-looking race than the generality of French peasants. They have also something distinctive in their costume. In travelling through France any change from the blouse is a relief; and in La Vendée the men often wear loose jackets and trowsers of home-spun linsey-woolsey, with long-tasselled white night-caps, or enormously broad-brimmed, and by no means ungraceful, felt hats. The head-dress of the women is uniformly a formidable flattened species of cap, rising a foot and a-half or so over the forehead, and composed of folds either of cambric or lace. However dirty the rest of their dress may be, it seems a point of honour that the cap at all events shall be clean. A woman sitting in the narrow doorway of a cottage, in her ponderous head costume, seems sufficient to block up all entrance. There are various species of labour besides that of the fields—many of them, however, unfeminine enough—in which the women are generally employed. One of these is brick and tile making. Near Bressuire I found a regular manufactory of these articles carried on by women and girls. The workshop was a great open shed, the sides being merely formed of isolated planks, on which the moulded lumps of wet clay were drying. At one end was a species of mill, worked by a jaded old horse, who slowly dragged round a wooden roller, mashing the coarse clay placed beneath it. The lumps were then carried to the tables where the women worked, and by them kneaded with their bare hands into the required consistency. The bricks were formed by placing the material in an iron mould, smoothing the surface by means of water and the palm of the hand. The tiles were similarly manufactured, upon a concave mould. The women worked by the piece. They were shy of telling their earnings, but at length pronounced them to be from twelve to twenty sous per day. Altogether the labour, coarse and unfeminine, told unmistakeably upon the appearance of the women—the younger looked sluts, and the elder ones beldames.

Another kind of work in which women are generally employed in the country villages is, beating out and preparing the fibres of flax for spinning. This they do either by means of machines constructed so as to squeeze the fibres by levers worked like pump handles, or, in more primitive fashion, in the open air, by laying the material upon a flat stone, and pounding it with a wooden mallet. In one stagnant little village which I inspected, there was quite a tiny factory of flax beaters. They divided with the blacksmith and farrier a detached building constructed for the purpose, and earned, as they told me, eight sous per day and their food. The atmosphere of the place was thick and oppressive from the quantity of dust and fibre floating in the unventilated air. The flax is spun in a great measure upon the distaff. One venerable old dame told me that they had tried to introduce the spinning-wheel into her village, but that the people would have nothing to do with any such newfangled notions. There was nothing, she said, like the good old *quenouille* which their fathers and mothers, who were just as good as they were, had been content with before them. Occasionally you find a village, or *bourg* as they are called in the phrase of the country, with quite a manufacturing staple. On the road between Bressuire and Thonau is such a place; every second building being either a pottery workshop, or a rude shed adapted to drying the ware. The articles turned out are coarse brown pots, pans, and jars; some of them, however, of elegant mould, the shape having remained unvaried for generations. In these petty manufacturing settlements there is generally some sort of life. A government tobacco-shop faces the auberge. Sometimes a miserable den of a café lurks amid crumbling walls and tottering gables; and a feeble attempt at a shop in the general line offers its household wares for inspection through a couple of panes of dirty glass. But the genuine agricultural *bourg*—the residence either of the small proprietors or of the lower class of farmers of the neighbourhood—is a place perfectly *sui generis.* It has neither streets nor shops. It is simply a collection of hovels and cottages, more or less rudely built—dunghills, cart sheds, and pig-styes, and infinitesimal morsels of neglected and weed-grown gardens, all jumbled and tumbled together in the strangest hap-hazard fashion; so that when a resident wishes to call upon a friend half-a-dozen houses off, he has probably to pass through as many cow houses, scramble over as many garden walls, and pick his way among as many green pools of stagnant water oozing from the "middens." The gloriously branching walnut and chesnut trees which embower these hovel-warrens, and the bright green vines which are trailed up the rough walls and cluster beneath the wavering line of eaves, are the redeeming natural features of as miserable settlements as human beings ever lived in. Numbers of these places are, however, the *nuclei* of parishes, and boast their church and churchyards. The latter is sometimes tolerably well fenced and kept, with a great cross planted in the centre. In other cases the churchyard is left in a dismal state of dilapidation and neglect—pigs burrowing and routing among the graves, and all sorts of filth and rubbish flung wantonly about. Even in the most sedulously tended of these places I missed the wreaths of *immortelles* generally so characteristic of a French cemetery. The churches are very ancient, and quaintly uniform, being all of them constructed with enormous projecting eaves supported by pillars, and forming a species of verandah round the greater part of the building. They generally have fine old arched gateways, and indeed the doors of many of the cottages seem to have been hewn in rude imitation of massive gothic lintels. Inside, the churches are miserably dark, and as damp and dank as so many caves. They are abundantly ornamented with painting; and such painting! the most utterly uneducated and abject daubs that sign-painter ever turned out, representing the principal events of the life and death of the Saviour. One wonders how it can possibly happen that the clergy—who must, at all events, have some tincture, however slight, of the elevation of taste which education affords—permit the holy edifices under their charge to be polluted by the painfully ludicrous artistic efforts in question. In other respects these solemn old churches have been injured and defaced. Where original carved portals have failed, or elegant buttresses have yielded, masses of modern carpentry and bricklaying have been introduced; while in the interior you frequently find a pulpit knocked up out of deal boards by the nearest artisan, placed beside a curiously carved lectern, traced by an artist's chisel. A very ancient clock in one of these structures was, I think, about the rudest specimen of horology ever put together and set going. The machine was enclosed in front of a great wooden ledge, running along one side of the church, and to which access was had by a ladder. Fancy, then, a dial-plate formed exactly on the principle of, and very similar in appearance to, the head of a barrel—fancy a single hand like a thick cudgel, with a great tin half-moon at each end, the machinery set in motion by weights formed of two unshapen lumps of stone, slung in knotted cords—fancy all this, and you have an idea of a timepiece which, for all its roughness of style, did its work, as I was told, with commendable regularity.

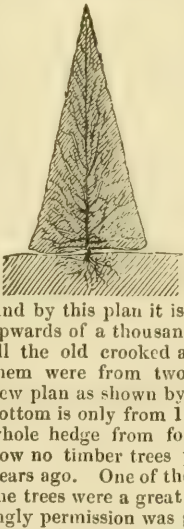
The interior of the cottages in question is generally poor enough, and more than slovenly enough. The floor is almost universally earthern, or, if originally composed of stone or brick, is broken and splintered in a dozen places. You frequently observe masses of the pods of haricot beans, kicked about and trodden on by all the inmates, and the door-way is pretty sure to be wet and slippery from the slops constantly flung there. Still there will be a decent bed or two, with dark furniture; a more or less dilapidated walnut chest of drawers, and a meagre collection of very rough crockery upon the ample chimney-piece. In the better class of farm-houses and auberges their vast hearths are the grand characteristics of the rooms. The fire-place is often large enough to stand upright in, and the mantel-piece is quite a masonic triumph. On either side of the great hearth-stone a dark upright slab rises at a sharp angle from the floor, so as to overhang it by several feet. Upon this vantage ground is reared ledge after ledge of corner-stone shelf, projecting over the cavernous fireplace beneath, and affording a resting-place for a legion of small household matters. In the better class of *foyers* there is always a good roasting-jack hung up beside the fire, while, over the spluttering flame of beech and birchen boughs, pots of soup and vegetable messes are constantly simmering. Round such a fire-place in an auberge frequented by the neighbouring labourers, you have frequently a picturesque dinner-scene. Men—sturdy, swarthy fellows from the plough—lounge, clasp-knife in hand, against the iron railing which fences in the hearth; boys—urchins relieved for a brief space from the care of one cow or three sheep—squat in the ashes with great basins of soup and vegetable stews upon their knees; while the mistress of the establishment, towering in her piled-cambric cap over the heads of the guests, stirs the seething pot, ladles out great messes of the broth, or hurries hither and thither, producing another and still another of the vast brown loaves which French peasants have a knack of causing to disappear in a style well fitted to astonish those who for the first time witness the performance. Whatever, indeed, may be the nourishing, the blood-making, and bone-making qualities of the food of the French rural labourers, there can be no question that they have plenty of it. Four good filling meals a day is the universal rule in farmhouses, and you continually find the men with hunches of bread in their hands staying their stomachs between whiles. A great deal of butter is used in the preparation of the vegetable messes, particularly in that of the never-failing haricots; and I seldom see a dinner unaccompanied by some scraps of well-stewed or well-boiled meat, dragged out from time to time by the operators from among the debris of savoury vegetable matter. In a vine country wine is as universal as soup is everywhere. It is remarkable, however, to observe the great moderation in which the lower class of people use it. They never show any compunction about leaving a half-emptied bottle; while you see big, sturdy fellows—who in England would be gulping down their gallons of heavy heady beer—drowning, by copious applications of the water *caraffe*, the by no means overmastering spirit of the original potation; and in the La Vendée district, by the way, the water is by no means so good as to be in itself a matter of temptation. Towards the sea the springs are brackish. Further inland the streams are few in number, and muddy and thick in character, having a great tendency to expand into sedgy pools and bits of fat rich marsh. In the course of my rambles by one of the latter I was edified by overhearing a miller, who was arranging his sluices, addressing a by no means complimentary allocution to the stream which turned his mill, and which he charged with being the most *embêtant* river in all the country, constantly tantalising him with too much water or too little. This man told me that the corn he ground was generally his own. He sent round a cart from bourg to bourg, buying the grain of the small proprietors, and selling the flour afterwards to the bakers. His mill, like all its rival competitors turned by water or wind, was constructed on the old-fashioned one-mill-stone principle.

The *cafés*, however, rather than the *auberges*, are the besetting temptation of Frenchmen in town and country. The time spent in these places by persons whom we should designate as working men is extraordinary. Except in the merest jumble of hovels, such as I have described, there is not a village in France, however trivial, which does not boast its two or three cafés, and, of course, billiard tables. You may not be able to purchase the most ordinary articles a traveller requires, but you can always have a game at pool. I found billiard rooms in filthy little hamlets in Vendée and the "Two Sevres," inhabited entirely by persons of the rank of English agricultural labourers. At home, we associate the game with great towns, and, perhaps, with the more dissipated portion of the life of great towns. Here, even with the thoroughly rustic portion of the population, the game seems a necessary of life. And there are, too—contrary to what might have been expected—few or no make-shift-looking trumpery tables. The *cafés* in the Palais Royal, or in the fashionable boulevards, contain no pieces of furniture of this description more massive or more elaborately carved and adorned than many I have met with in places hardly aspiring to the rank of villages. It has often struck me that the billiard table must have cost at least as much as the house in which it was erected; but the thing seemed indispensable, and there it was in busy use all day long. A correct return of the number of billiard tables in France would give some very significant statistics relative to the social customs and lives of our merry neighbours. It would be an odd indication of the habits of the people, should there be found to be five times as many billiard tables in France as there are mangles. Cards and dominoes form the other chief attractions of the country *cafés* where newspapers are scarce, and perhaps a considerable number of the guests are unable to read the few which do abound. There is something to English ways of thinking desperately idle in the scene of a couple of big burly working men, sitting in the glare of the sun-light the best part of the day, wrangling over a greasy pack of cards, or rattling dominoes upon the little marble tables. These are, however, but the exceptional foibles of, in the main, a thoroughly industrious people. A trait which does honour to French prudence and foresight among the humbler classes, and one which has been lately much forced upon my attention, is the very general habit of insuring against risks from fire. This is particularly noticeable amongst the humbler classes, and the observant traveller through rural France will remark the plates of insurance companies affixed by scores and hundreds to dwellings, the total value of which, furniture included, is probably under £20.

CUTTING QUICKS.—It is my opinion that the best practice is to cut quicks before planting them. I would recommend planting them flat on the bank of earth on which they are usually planted, thus—



This bank should be raised about six inches in front, and sloped down at the back, so that when the quicks are planted, and the roots covered with six or eight inches of soil, an imaginary section would have the form of the annexed sketch. The branch end of the quicks thus cut and planted, should not project more than an inch from the angle. When thus treated in the spring, the plants send out a number of shoots, which take an upright direction, and grows from eighteen to twenty inches high the first year. This practice has been followed for many years on the estates of the Duke of Hamilton in this neighbourhood, and I believe the fences thus grown are not to be surpassed by any others in the kingdom. They have been grown in a comparatively short time, and in all soils and situations, being completely "feathered" to the ground. They are cut in the tapering form thus, and a number of labourers are employed all the year round in their general management, as cutting, planting, and weeding, as it is believed that if this were left to the farmers, they would not pay the attention to them which they require. And by this plan it is supposed that the Duke has got upwards of a thousand acres of land by clearing away all the old crooked and rugged fences, and some of them were from two to three yards wide. By the new plan as shown by fig. (2) the broadest part at the bottom is only from 18 to 24 inches through, and the whole hedge from four to five feet high. There are now no timber trees planted in these fences as some years ago. One of the Duke's tenants reported that the trees were a great injury to the land, and accordingly permission was granted to have them cut down. Some of these fences may be seen upwards of a mile long, perfectly straight and regular in all their parts. His Grace is at the entire expense of draining the land, and last year had more than 100 drainers at work on the different farms. The draining season begins about November and ends in February.



M. SAUL, *Garstang*.

STALLIONS FOR THE SEASON.

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of winners out by	Sire of	Standing at	Apply to	Price.
Accident	brown	16	by Camel, out of Miss Breeze, by Phantom	never appeared	—	10	Intrepid	Delamere Forest, Chesh.	Mr. R. Martin	7 gs., h. b. 3 gs.
Alarm	bay	9	by Venison, out of Southdown, by Defence	started 17, won 13	won Ascot Cup	untried.	—	Hampton Court Pdks.	—	12 gs.
Alphege	chesnut	15	by Dunsinane, out of Alphege, by Buffalo	never appeared	—	untried.	—	Cherry Down, Chingford Essex	—	2½ gs.
Annandale	brown	9	by Touchstone, out of Rebecca, by Lottery	started 15, won 3	ran second for Derby	untried.	—	LanePaddocks, Sheffield	F. Croft	10 gs., h. b. 5 gs.
Arab, an	black	—	From Egypt – a pure Arab	never ran	—	untried.	—	6, Park-lane, London	Mr. T. Cooper	—
Aristotle	brown	12	by Physician, out of Solace, by Longwaist	started 60, won 23	won Liverpool Cup	untried.	—	Stockbridge, Hants	Mr. Young King	10 sovs.
Auckland	brown	11	by Touchstone, out of Maid of Honour, by Champion	started 9, won 5	won £700 at Ascot	7	Lady Eden	Stoke's Farm, Wokingham	Mr. Rand	10 gs., h. b. 5 gs.
Ballinkeele	bay	12	by Irish Birdcatcher, out of Perdita, by Langar	started 6, won 3	won the Anglesea S.	1	West Indian	Broughton. Stockbridge	Mr. Dixon	10 gs.
Barnton	bay	7	by Voltaire, out of Martha Lynn, by Mulatto	started 3	—	untried.	—	Leyburn, Middleham	Mr. Ridley	7 gs., dams of winners half price
Bay Middleton	bay	18	by Sultan, out of Cobweb, by Phantom	started 7, won 7	won the Derby	87	Flying Dutchman	Danebury Pdks., Stockbridge	—	30 gs. (30 subs.)
Beverlac	bay	6	by Hetman Platoff, dam by Plenipotentiary	started 4, won 3	won £275 at Chester.	untried.	—	Frith Manor, Hendon	Mr. C. Lily	7 gs.
Birdcatcher, Irish	chesnut	18	by Sir Hercules, out of Guiccioli, by Bob Booty	started 15, won 6	won the Madrids	55	The Baron	Stud Paddks., Newmkt.	Messrs. Barrow	15 sovs.
Bishop of Romford's Cob	brown	11	by Jereed, out of Jemima, by Count Porro	started 61, won 26	won the Royal Hunt Cup	untried.	—	Skirmett, Henley-on-Thames	Mr. T. Hussey	5 sovs., h. b. 2 sovs.
Black Prince	black	9	by Touchstone, out of Queen of Trumps, by Velocipede	started 1	—	untried.	—	Kilsby, Northampton	Mr. C. Hunt	2 gs.
Blarney	brown	4	by Mulatto or Balinkeele, out of Bohemienne, by Confederate	started 4, won 2	won New S. at Ascot	untried.	—	Broughton, Stockbridge	Mr. Dixon	10 gs.
Burgundy	bay	8	by Ishmael, out of Caroline, by (Irish) Drone	started 24, won 13	won Newton Manor Cup	untried.	—	Curragh, Kildare	Mr. Keegan	5 gs., h. b. 3 gs.
Cæsar	bay	15	by Sultan, out of Cobweb, by Phantom	started 6, won 3	won the Riddlesworth	10	Icicle	Stud Paddks., Newmkt.	Messrs. Barrow	10 gs., h. b. 5 gs.
California (Bro to Riddlesworth)	chesnut	18	by Emilius, out of Filagree, by Soothsayer	never appeared	—	4	The Mease	Bushbury, Wolverhampton	Mr. Phillips	5 gs., h. b. 3 gs.
Catesby	bay	10	by Slane, out of Cobweb, by Phantom	started 1	—	untried.	—	Brixworth, Northampt.	T. Moody	10 gs., h. b. 3 gs.
Chabron (late Dromedary)	brown	7	by Camel, out of Fanny, by Whisker	started 20, won 4	won £90 at Newmarket	untried.	—	Phantom Cottage, Newmarket	—	3 gs.
Chanticleer	grey	8	by Irish Birdcatcher, out of Whim, by Drone.	started 37, won 21	won Doncaster Cup	untried.	—	Rawcliffe Paddks., York	—	12 gs. (50 subs.)
Charles XII.	brown	15	by Voltaire, out of Wagtail, by Prime Minister	started 34, won 19	won St. Leger	16	The Swede	Lane Paddocks, Sheffield	F. Croft	12 gs.
								Carnaby, Beverley, &c.	H. Robinson	7 gs.
Chatham	chesnut	12	by The Colonel, out of Hester, by Camel	started 16, won 8½	won the Criterion	4	Woolwich	Ham, Arundel	R. Mates	17 gs. (20 subs.
Collingwood	bay	8	by Sheet Anchor, out of Kalmia, by Magistrate	started 70, won 34	won the Royal Hunt Cup	untried.	—	Maresfield Park, Sussex	Msrs. Weatherby	10 gs. (30 subs.
Colwick	brown	23	by Filho-da-Puta, out of Stella, by Sir Oliver	started 28, won 9	won Chester Cup	25	Attila	Castlerea, Roscommon	—	4 sovs., h. b. 2 sovs.
Conyngham	bay	7	by Slane, dam by Whisker	started 8, won 4	won 2000 Guineas S.	untried.	—	Stud Paddks., Newmkt.	Messrs. Barrow	7 sovs., winners and dams of. 5 sovs.
Cotherstone	bay	11	by Touchstone, out of Emma, by Whisker	started 11, won 7½	won the Derby	16	Glauca	Althorpe, Northampton	Mr. J. Elliott	25 gs. (20 subs.
Cowl	bay	9	by Bay Middleton, out of Crucifix, by Priam	started 8, won 5	won Buckenham S.	1	Celandine filly	Leybourne, Maidstone	Mr. Tweed	15 gs.
Cranebrook	chesnut	8	by Alcaston or Lord John, out of Urganda, by Tiresias	started 19, won 6½	won the G. York Hand.	untried.	—	Cow Lane, Northampton	Mr. S. Dickens	5 gs., h. b. 3 gs., winners and dams of 100 guineas.

Crozier	bay	7	by Lanercost, out of Crucifix, by Priam	started 13, won 3½	won £650 at Ascot	untried.	—	Ardee, Co. Louth	Mr. Hatch	4 sovs., h. b. 2 sovs.
The Currier	brown	15	by The Saddler, out of Amaryllis, by Cervantes	started 56, won 15½	won Glo'stershire S.	untried.	—	West Hill Farm, Wandsworth	H. Redman	6 gs., h. b. 3 gs.
The Dean	brown		by Voltaire, out of Trampina, by Tramp	started 42, won 21	won Glo'stershire S.	untried.	—	Athlone, Ireland	—	3 sovs., h. b. £1 10s.
Dey of Algiers	bay	15	by Priam, dam by Bustard	started 13, won 3	won Chester Cup	untried.	—	Hampton Court Padks.	—	10 gs., h. b. 5 gs.
Don John	bay	16	by Tramp or Waverley, dam by Comus	started 10, won 9	won St. Leger	35	Lady Evelyn	Stud Paddks, Newmkt.	Messrs. Barrow	15 gs. (25 subs.)
Dulcimer	chesnut	15	by Muley, out of Dulcamara, by Waxy	started 1	—	4	Dulcet	Carroll's Farm, Woodford Wells	B. Herriott	20 sovs.
Earl of Richmond	brown	11	by Touchstone, out of Queen of Trumps, by Velocipede	started 1, won 1	won Lyme Park Stakes	4	The Ballet Girl	Theobald's Stud Farm, Enfield	Mr. A. Gray	7 gs., h. b. 2 gs.
Epirus	chesnut	17	by Langar, out of Olympia, by Sir Oliver	started 31, won 12	won Copeland Handicap	23	Pyrrhus the First	Pitsford, Northampton.	Mr. Potterton	25 gs. (40 subs.)
The Era	bay	11	by Plenipotentiary, dam by Whisker	started 26, won 7	won Liverpool Cup	untried.	—	Bromyard, Herefordsh.	Mr. Devereux	5½ gs., h. b. 2 gs.
The Fallow Buck	brown	6	by Venison, out of Plenary, by Emilius	never appeared	—	untried.	—	Andler's Ash, Petersfield	Mr. W. Ayling	2 gs.
Faugh-a-Ballagh	brown	10	by Sir Hercules, out of Guiccioli, by Bob Booty	started 9, won 5	won St. Leger	untried.	—	Dean's Hill, Stafford	Mr. J. Painter	12 gs.
Flatcatcher	bay	6	by Touchstone, out of Decoy, by Filho-da-Puta	started 26, won 1	won 2,000 Gs. Stakes	untried.	—	Ebberston, Malton	R. Thorpe	5 gs.
Footstool	bay	8	by The Saddler, out of Trudge, by Tramp	started 24, won 13	won Swinley Stakes	untried.	—	Turf Tavern, Doncaster	—	7 gs., h. b. 3½ gs.
Foxberry	bay	12	by Voltaire, out of Matilda, by Comus	started 39, won 9	won Glasgow Cup	untried.	—	Prestbury, Cheltenham	Msrs. Humphreys	10 sovs., h. b. 5 sovs.
Gabbler	bay	7	by Bay Middleton, out of Flycatcher, by Godolphin	started 14, won 3	won £325 at Doncaster	untried.	—	Erdington, Birmingham	J. Sheppard	5 gs.
Galaor	bay	13	by Muley Moloch, out of Darioletta, by Amadis	started 13, won 5	won Manchester Cup	untried.	—	Harker Lodge, Carlisle	J. Watson	7 gs.
Ghillie Callum	bay	4	by Gladiator, out of Reel, by Camel	started 4, won 2	won £800 at Goodwood	untried.	—	Goodwood	Mr. Kent	10 sovs.
Gibraltar	bay	14	by Muley, out of Young Sweet-Pea, by Godolphin	started 9, won 5 and divided 2	won the Port	untried.	—	Bonehill Fm., Tamworth	—	10 gs., h. b. 5 gs.
Glentilt	chesnut	7	by Plenipotentiary, out of Glenlui, by Sultan	started 4, won 3	won the Clearwell	untried.	—	Danebury Paddocks, Stockbridge	—	7 gs., h. b. 3½ gs.
Harkaway	chesnut	17	by Economist, dam by Naboclish	started 38, won 25	won Goodwood Cup. (2)	43	Peep o'Day Boy.	Willesden Paddocks	Messrs. Tattersall	15 gs.
Hautboy	chesnut	14	by Muley, out of Dulcamara, by Waxy	started 25, won 6	won £110 at Hereford	untried.	—	Carroll's Farm, Woodford Wells	B. Herriott	20 sovs.
The Hero	chesnut	8	by Chesterfield, out of Grace Darling, by Defence	started 37, won 29	won Emperor's Plate	untried.	—	Houghton Down, Stockbridge	Mr. H. Jeater	10 gs.
Heron	brown	18	by Bustard, dam by Orville	started 41, won 17	won Liverpool Cup	8	Ribaldry	Erdington, Birmingham	J. Sheppard	5 gs.
Hetman Platoff	brown	15	by Brutandorf, dam by Comus	started 10, won 6	won Northumberland P.	43	Cossack	Tickhill Castle Farm, Rotherham	W. Hornshaw	10 gs.
The Hydra	chesnut	16	by Sir Hercules, out of Zebra, by Partizan	started 19, won 5	won Croxton Park Cup.	5	Mark Tapley	Bodicot, Banbury	Mr. B. Austin	5 sovs., h. b. £2 10s.
Iago	brown	8	by Don John, out of Scandal, by Selim	started 18, won 10	ran second for St. Leger	untried.	—	Dringhouses, York	Mr. Wilkinson	10 gs.
Idas	bay	9	by Liverpool, out of Marpessa, by Muley	started 24, won 13	won 2,000 gs. Stakes	untried.	—	Melton Mowbray	Mr. E. Cunnington	5 gs., h. b. £2 10s.
Jeremy Diddler	brown	12	by Jerry, out of Marpessa, by Muley	started 9, won 6	won the Wokingham	3	Windischgratz	Rawcliffe Paddks., York	Mr. Bateson	7 gs., h. b. 2 gs.
Jericho	brown	9	by Jerry, out of Turquoise, by Selim	started 22, won 11	won the Port	untried.	—	Newmarket	Mr. J. Rogers	10 gs.
Intrepid (h. b.)	brown	10	by Accident, dam by Sir Hercules	started 32, won 13	won Chester Cup	untried.	—	Dun Cow, Over, Cheshire	Mr. Livesley	5 gs., h. b. 3 gs.
Johnny	brown	14	by Elvas, out of Perdita, by Langar	started 40, won 8	won Ascot S.	untried.	—	Lamport, Northampton.	Mr. Treadgold	3 gs.
John o' Gaunt	chesnut	13	by Taurus, out of Mona, by Partizan	started 38, won 23	won Newmarket S.	3	Bolingbroke	Stud Paddks., Newmkt.	Messrs. Barrow	15 gs. (40 subs.)
Ion	brown	16	by Cain, out of Margaret, by Edmond	started 6, won 1	ran second for the Derby	10	Tadmor	Stud Paddks., Newmkt.	Messrs. Barrow.	15 sovs.
Ishmaelite	chesnut	10	by Ishmael, dam by Humphrey Clinker	never appeared	—	untried.	—	Downpatrick, Ireland	J. Sury	4 sovs., h. b. 2 sovs.
Ithuriel	bay	10	by Touchstone, out of Verbena, by Velocipede	started 3, won 2	won Liverpool Leger	untried.	—	Morton-on-Swale	J. Burden	10 gs., h. b. 5 gs.
King of Kildare	bay	6	by Tearaway, out of Anna Maria, by Huntington	started 22, won 8	won Curraghmore S.	untried.	—	Belgrave Gate, Leicester	Mr. E. Bailey	5 gs., h. b. 2½ gs.
Knight Templar	chesnut	7	by Jack-in-the-Green, out of Babel, by Interpreter	never appeared	—	untried.	—	Templenewsdam, Leeds.	Mr. J. Mills	5 gs., winners *gratis* h. b. £2 5s.
Kremlin	brown	15	by Sultan, out of Francesca, by Partizan	started 13, won 6	won Cleveland Cup	12	Passion Flower	Dairy Fm. Hgh Wycombe	Mr. T. Robinson.	7 gs., h. b. 2½ gs.
Lanercost	brown	16	by Liverpool, out of Otis, by Buzzard	started 40, won 26	won Ascot Cup	81	Van Tromp	Hampton Court Pdks.	—	15 sovs.

STALLIONS FOR THE SEASON—(*Continued*).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of winners out by.	Sire of	Standing at	Apply to	Price.
Launcelot	brown	14	by Camel, out of Emma, by Whisker	started 10, won 6½	won St. Leger	14	Portia	Hartlepool, Durham	—	10 gs.
The Libel	brown	9	by Pantaloon, out of Pasquinade, by Camel	started 7, won 3	won Chester St. Leger	1	Truth	Willesden Paddocks	Messrs. Tattersall	11 gs.
Loup-Garou	brown	5	by Lanercost, out of Moonbeam, by Tomboy	started 6, won 1	received £15 ft.	untried.	—	Lower Caversham, Reading	Mr. A. Bond	10 gs., winners and dams of, *gratis*
Manchester	bay	23	by Whisker, out of Muta, by Tramp	started 36, won 11	won Ludford S.	—	—	Syston, Leicester	Mr. J. C. Moore	7 gs., h. b. 3 gs.
Marcian	brown	19	by Chateau Margaux, out of Marchesa, by Comus	started 2, won 1	won £65 at Epsom	—	—	Pickering, Malton, &c.	Mr. W. Bower	5 gs., h. b. 2 gs.
Malton	bay	6	Sheet Anchor, out of Fair Helen, by Priam	started 12, won 3	won Chester Cup	untried.	—	Cross Keys, Dringhouses, York	Mr. J. Pearson	5 sovs., h. b. 2 sovs
Melbourne	brown	17	by Humphrey Clinker, dam by Cervantes	started 18, won 9	won the Palatine S.	25	Sir Tatton Sykes.	Causton Lodge, Rugby	W. Scott	18 gs.
Merry Monarch	bay	9	by Slane, out of The Margravine, by Little John	started 4, won 1	won the Derby	1	Henrietta	Ham, Arundel	R. Mates	10 gs.
Metal	brown	17	by Winton, dam by Humphrey Clinker	started 19, won 2	won £50 at Wolverhmp.	untried.	—	Cholwell, Totness	Mr. Watson	5 sovs., h. b. 2 sovs.
Meteor	chesnut	12	by Velocipede, out of Dido, by Whisker	started 2, won 1	won £2,000 gs. S.	1	Spot	Lutterworth, Leicester	Mr. Lucas	10 gs., h. b. 3 gs.
Minotaur	chesnut	11	by Taurus, out of Lyrnessa, by the Flyer	started 22, won 12	won £800 at Newmarket	1	Theseus	Fountain Inn, Bedford	Mr. Ward	6 gs., h. b. £2 5s.
Muley Moloch	brown	21	by Muley, out of Nancy, by Dick Andrews	started 17, won 11	won the Port	81	Alice Hawthorn.	Askham Bryan, York	R. Hebblethwaite	5 gs., h. b. 2 gs.
The Mummy	chesnut	18	by Memnon, out of Mouche, by Emilius	started 2, won 2	won £200 at Warwick	4	Skeleton	Peterborough	Mr. Church	5 gs., h. b. £1 5s.
Mustapha	bay	—	A pure Arab	never appeared	—	untried.	—	Home Park, Hampt. Crt.	—	2 gs.
Newcourt	bay	11	by Sir Hercules, out of Sylph, by Spectre	started 19, won 8	won Herefordshire S	untried.	—	Northleach	Mr. Isaac Day	10 gs. (20 subs.)
Nutwith	bay	11	by Tomboy, dam by Comus	started 7, won 3	won St. Leger	4	Nutshell	Burghley, Stamford	Mr. H. Rose	20 sovs. (40 subs.)
The Odd Mixture	black	10	by Ion, out of Mary Ann, by Blacklock	started 9, won 2	won £70 at Newmarket.	—	—	Cherry Down, Chingford	—	3½ gs.
Old England	bay	9	by Mulatto, out of Fortress, by Defence	started 12, won 8	won New S. at Ascot	—	—	Leybourne, Maidstone	Mr. Tweed	10 gs.
Orlando	bay	10	by Touchstone, out of Vulture, by Langar	started 11, won 10	won the Derby	3	Teddington	Hampton Court Pdks.	—	15 sovs.
Othello	black	—	by Old Roller, dam by Quiz		—	—	—	Syston, Leicester	Mr. J. C. Moore	5 gs., h. b. 2 gs.
Oxonian	bay	7	by Wintonian, dam by Laurel	started 2	—	untried.	—	Castlerea, Roscommon.	—	4 sovs., h. b. 2 sovs.
Paragone	bay	8	by Touchstone, out of Hoyden, by Tomboy	started 12, won 8	won Coffee-Room S.	untried.	—	Stud Paddks., Newmkt.	Messrs. Barrow	10 gs., h. b. 5 gs.
Perken Warbeck	chesnut	10	by Beiram, out of Romaike, by Rowton	started 1	—	untried.	—	Belgrave Gate, Leicester	Mr. E. Bailey	5 gs., h. b., 2½ gs.
Phlegon	bay	11	by Beiram or Sultan, out of Lucetta, by Reveller	started 6, won 2	won G. Duke Michael S.	1	Phlegra	Burghley, Stamford	Mr. H. Rose	10 sov.
Plenipotentiary	chesnut	20	by Emilius, out of Harriet, by Pericles	started 8, won 7	won the Derby	46	The Era	Horsheath, Cambridge	—	10 sovs., h. b. 5 sovs.
Pompey	brown	11	by Emilius, out of Variation, by Bustard	started 26, won 10	won Gt. York. Hand. (2)	untried.	—	Burton Pidesea, Hull	Mr. Baxter	5 gs.
Pontifex	bay	4	by Touchstone, out of Crucifix, by Priam	never appeared	—	untried.	—	Great Driffield	Mr. T. Howden	7 gs., h. b. 2 gs.
Poynton	bay	8	by Touchstone, out of Lady Stafford, by Comus	started 6, won 2	won Great Yorksh. S.	untried.	—	Old Sand Hill, Colliergate, York	Mr. S. Reed	7 gs.
Pyrrhus the First	chesnut	8	by Epirus, out of Fortress, by Defence	started 13, won 10	won the Derby	untried.	—	Easby Abbey, Richmond, Yorkshire	Mr. Wintringham	10 gs., h. b. 5 gs.
Ramadan	bay	14	by Beiram, dam by Reveller	started 6, won 1	won £50 at Newmarket.	untried.	—	Selby, &c.	Mr. J. Markham	5 sovs., h. b. 2 sovs.
Ratan	chesnut	10	by Buzzard, dam by Picton	started 7, won 3	won the Criterion	4	Penang	Angel, Catterick	Mr. J. Abbott	7 gs., h. b. 2 gs.
Ratcatcher	chesnut	21	by Langar, out of Rufina, by Blacklock	started 65, won 25	won the Cleveland Cup.	9	Rat-Trap	Willesden Paddocks	Messrs. Tattersall	9 gs., h. b. 4½ gs.
Red Deer	bay	10	by Venison, out of Soldier's Daughter, by The Colonel	started 20, won 10	won the Chester Cup	2	Aristos	Theobald's Farm, Enfield	Mr. A. Gray	10 gs., h. b. 3 gs.
Red Hart	bay	7	by Venison, out of Soldier's Daughter, by The Colonel	started 16, won 8	won Grand D. Michael S.	untried.	—	Goodwood	Mr. Kent	10 sovs., h. b. 5 sovs.
Robert de Gorham	brown	12	by Sir Hercules, out of Duvernay, by Emilius	started 20, won 7	ran second for the Derby	4	The Nigger	Ham, Arundel	R. Mates	17 gs (20 subs.)
Robinson	brown	16	by Robin, out of Miss Muley, by Muley	started 15, won 7	won £140 at Newcastle	untried.	—	Skerne, Driffield, &c.	Mr. R. Stockdale	5 gs., h. b. 2 gs.

Roland	bay	5	by The Saddler, out of Executrix, by Liverpool	started 15, won 2	won Wolverhampton S.	untried.	——	Nunk Monkton, York	Mr. T. Groves	5 gs., winners and dams of, *gratis*, h. b. 2 gs.
Roscius	brown	15	by Turcoman, out of Miss Foote, by Whisker	started 33, won 12	won Cambridgeshire S.	——	——	Turf Tavern, Doncaster	——	7 gs., h. b. 3 gs.
St. Francis	bay	16	by St. Patrick, out of Surprise, by Scud	started 49, won 28	won the Ascot Cup	15	St. Rosalia	Newmarket	Mr. Pettit	10 sovs., h. b. 5 sovs.
St. Lawrence.	brown	14	by Skylark or Lapwing, out of Helen, by Blacklock	started 58, won 28	won the Chester Cup	untried.	——	Lowfold, Wisborough, Sussex	W. Scutt	2 gs.
St. Luke	chesnut	16	by Bedlamite, dam by Comus	started 26, won 8	a good King's Plater	4	Crazy Lad	Turf Tavern, Doncaster	——	6 gs., h. b. 3 gs.
St. Martin	brown	16	by Actæon, out of Galena, by Walton	started 19, won 9	won Dumfries Cup	20	Eryx	LanePaddocks, Sheffield	F. Croft	5 gs., h. b. 3 gs.
St. Valentine	bay	4	by Lanercost, out of Fair Louisa, by Voltaire	started 2, won 2	won £50 at Ripon	untried.	——	Haworth Arms, Newland, Hull	J. Hyde	5 gs.
Scutari	bay	14	by Sultan, out of Velvet, by Oiseau	started 22, won 9	won Newmarket S.	2	Midia	Burghley, Stamford	Mr. H. Rose	10 sovs.
The Sea	bay	21	by Whalebone, dam by Orville	started 5, won 2	ran well in steeple-chases	3	Mermaid	Bonehill, Tamworth	——	8 gs , h. b. 3 gs.
Sensation	brown	9	by Slane, out of Adela, by Emilius	started 8, won 1	won £50 at Bibury	untried.	——	Cherry Down, Chingford	——	2½ gs.
Sir Hercules	black	25	by Whalebone, out of Peri, by Wanderer	started 9, won 7	won the Claret	77	Faugh-a-Ballagh	Wilton, Wilts	——	10 sovs., h. b. 5 sovs.
Sir Isaac	brown	20	by Camel, out of Arachne, by Filho da Puta	started 7, won 3	won a Produce S. Liverp.	7	Yardley	Yardley, Birmingham	Mr. Holloway	10 gs., h. b. 3 gs.
Sir Roland (de Bois)	bay	6	by Touchstone, out of Falernia, by Chateau Margaux	started 1	——	untried.	-	5, Park Terrace, Brixton Hill	Mr. Ramsey	6 gs., h. b. 3 gs.
Sir Tatton Sykes	bay	8	by Melbourne, dam by Margrave	started 12, won 4	Won St. Leger	untried.	——	Theobald'sFarm, Enfield	Mr. A. Gray	10 gs., h. b. 5 gs.
Slane	bay	18	by Royal Oak, dam by Orville	started 18, won 9	won Waterloo Shield	69	The Princess	York and Murton Stud Farm	Mr. T. Kirby	15 gs.
Spencer	bay	13	by Regulator, out of Limerick Lass, by Bravo	ran well in Ireland	won at Welter Weights	untried.	——	Repository, Limerick	Mr. Hartigan	£2 5s.
Split-cause	bay	4	by Melbourne, out of Lora, by Lory	started 1	——	untried.	——	Ashby-de-la-Zouch	Mr. Chubb	3 gs., h. b. £1 11s. 6d.
Springy Jack	bay	6	by Hetman Platoff, out of Oblivion, by Jerry	started 5, won 3	ran second for the Derby	untried.	——	Eaton Stud Ho., Chester	——	10 gs., h. b. 3 gs.
Surplice	bay	6	by Touchstone, out of Crucifix, by Priam	started 16, won 9	won the Derby	untried.	——	Turf Tavern, Doncaster	——	25 gs. (20 subs.)
Sweetmeat	brown	9	by Gladiator, out of Lollypop, by Starch	started 24, won 22½	won Queen's Vase	untried.	——	Neasham Hall, Darlington	T. Hodgson	10 sovs. (25 subs.)
Tadmor	brown	5	by Ion, out of Palmyra, by Sultan	started 11, won 8	won Gratwicke Stakes	untried.	——	MarbleHill, Twickenhm.	Mr. Moore	10 gs., h. b. 5 gs.
Tearaway	bay	13	by Voltaire, out of Taglioni, by Whisker	started 10, won 7	won the Madrids	6	Russborough	Hamilton Lodge, C. Kildare	Mr. Keegan	10 gs., h. b. 4 gs.
Theon	brown	14	by Emilius, out of Maria, by Whisker	started 6, won 3	won Doncaster 2 yrs. S.	6	Sagacity	Crown & Anchor, Ripon	Mr. R. Blacker	11 gs., winners and dams of, 7 gs.
Thistle-whipper	bay	13	by Beagle, out of Miss Muley, by Filho da Puta	started 11, won 8	won £325 at Newmarket	7	Thistledown	Longstock, Stockbridge	——	12 gs. (20 subs.)
Sohrab	grey	—	A pure Arab	never appeared	——	untried.	——	Home Park, Hampt. Crt.	——	2 gs.
Tory-Boy	brown	13	by Tomboy, out of Bessy Bedlam, by Filho da Puta	started 2, won 2	won Chester 2 yrs. S	3	The Iron Duke	Foxholes, Garstang	——	——
Touchstone	brown	20	by Camel, out of Banter, by Master Henry	started 21, won 16	won St. Leger	8	Cotherstone	Eaton Stud Ho , Chester	——	——
Triton	chesnut	9	by Glaucus, dam by Comus	started 14, won 4	won £55 at Exeter	untried.	——	Cherry Down, Chingford	——	2½ gs.
Trueboy	brown	11	by Tomboy, dam by Muley	started 45, won 11	won Manchester Cup	untried.	——	Beverley	Mr. W. Dalton	10 gs.
The Ugly Buck	bay	10	by Venison, out of Monstrosity, by Plenipo	started 5, won 3	won 2,000 gs. Stakes	3	Buckhound	Ravenhill, Belfast	——	5 gs.
Van Tromp	brown	7	by Lanercost, out of Barbelle, by Sandbeck	started 15, won 12	won St. Leger	untried.	——	York & Murton Stud Fm.	Mr. T. Kirby	20 gs. (50 subs.
Venison	brown	18	by Partizan, out of Fawn, by Smolensko	started 22, won 16½	won Portland Handicap	82	Alarm	Broughton, Stockbridge	Mr. Dixon	25 gs. (20 subs.
Verulam	bay	18	by Lottery, out of Wire, by Waxy	started 1	——	9	The Baroness	Lane Paddocks, Sheffield	F. Croft	12 gs.
Wintonian	brown	17	by Camel, out of Moninia, by Muley	started 4, won 3	won the Lavant	8	Rhedycina	Broughton, Stockbridge	Mr. Gale	10 gs., h. b. 3 gs.
Wood-Pigeon	bay	9	by Velocipede, out of Amina, by Sultan	started 17, won 7	won Ascot Stakes	untried.	——	Burghley, Stamford	Mr. H. Rose	10 sovs.
Young Cotherstone	bay	3	by Cotherstone, out of Lilla, by Bobadil	never appeared	——	untried.	——	Audlem, Nantwich	Mr. Lisle	7 gs., h. b. 3 gs.
Young Physician	bay	14	by Physician, out of Spaewife, by Soothsayer	never appeared	——	——	——	Selby, &c.	Mr. J. Markham	5 sovs., h. b. 2 sovs

The Groom's Fee varies from half-a-crown to a guinea ; it is occasionally but not often included. The Dey of Algiers covered one season in Holland. Birdcatcher, the Dean, Harkaway, Launcelot, and Tearaway have covered, if not still standing in Ireland : we may have not placed *all* the " winners out by" in that part of the kingdom to their credit.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEATH.
Day.	8 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8-9a.m	2 p.m.	10p.m.	
	in. cts.	in. cts									
Mar. 22	29.16	28.77	44	48	45	S. by East	v.brisk	cloudy	cloudy	cloudy	wet
23	28.97	29.30	43	50	45	S. Westerly	lively	cloudy	fine	cloudy	dry
24	29.46	29.68	42	48	45	W. by North	gentle	cloudy	cloudy	cloudy	rain
25	29.76	29.66	39	48	48	S. West	gentle	cloudy	cloudy	cloudy	wet
26	29.55	29.55	47	47	40	S. W., West	brisk	cloudy	cloudy	fine	wet
27	29.55	29.56	39	54	51	S. West	brisk	fine	cloudy	cloudy	rain
28	29.72	29.80	47	55	45	W. by N.Wly.	lively	cloudy	sun	cloudy	dry
29	29.63	29.65	44	52	43	S.W., Westerly	brisk	cloudy	cloudy	fine	rain
30	29.59	29.80	39	52	43	N.W., Nly.	lively	fine	fine	cloudy	rain
31	30.05	30.18	38	48	42	N. West	gentle	fine	sun	cloudy	dry
April 1	30.10	30.12	39	54	44	W.N.to E. & S.	gentle	fine	sun	cloudy	dry
2	30.11	30.07	41	50	46	S. West	gentle	cloudy	cloudy	fine	rain
3	30.04	30.14	45	53	46	North by West	gentle	cloudy	cloudy	cloudy	dry
4	30.14	30.05	41	50	52	Northerly	gentle	cloudy	fine	fine	rain
5	30.00	30.03	31	50	39	Easterly, N.E.	gentle	fine	sun	fine	dry
6	30.07	30.11	31½	46	34	East, E. by S.	gentle	fine	cloudy	fine	dry
7	30.11	30.08	28	48	38	East	brisk	fine	cloudy	cloudy	dry
8	30.01	29.94	38	46	40	N. East	gentle	cloudy	cloudy	cloudy	rain
9	29.86	29.88	39	44	38	N., W.N.W.	gentle	cloudy	cloudy	cloudy	rain
10	29.90	29.98	34	45	39	North by East	gentle	cloudy	cloudy	fine	dry
11	29.98	29.88	38	49	42	North by West	gentle	cloudy	cloudy	cloudy	rain
12	29.88	29.92	38	49	39	East, E. by S.	gentle	fine	sun	fine	dry
13	29.95	29.95	32	50	41	East by South	calm	cloudy	sun	fine	dry
14	29.95	29.90	35	50	43	E. or by S.	fresh	cloudy	cloudy	cloudy	dry
15	29.88	29.83	39	51	44	E. or by S.	fresh	cloudy	cloudy	cloudy	dry
16	29.88	29.78	42	60	46	S. E., var.	gentle	cloudy	fine	cloudy	rain
17	29.73	29.90	45	62	52	S. West	gentle	cloudy	sun	fine	rain
18	29.93	29.90	47	65	53	S. West	gentle	fine	sun	cloudy	dry
19	30.06	30.00	39	64	47	W. by N. by S.	gentle	fine	sun	fine	dry
20	29.80	29.50	42	62	54	South East	gentle	cloudy	cloudy	cloudy	rain

ESTIMATED AVERAGES OF APRIL.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.54	29.20	74	29	49.9

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
51.76	39.5	45.63

WEATHER AND PHENOMENA.

March 22—Many hours' rain, wind rises after sunset; 23—Fierce wind overnight, finer day; 24—Changeable; 25—Fine airy day; 26—Very wet till 4 p.m., clear night; 27—Variable and doubtful; 28—Fine day, evening doubtful; 29—Showery forenoon; 30—Showery, sunny intervals; 31—Day fine, changeable.

LUNATION.—Last quarter, 1h. 26 m. afternoon.

April 1—Fluctuating wind, smoky atmosphere; 2—Several hours' rain; 3—Overcast, bracing air; 4—Profuse rain early, finer day; 5—Fine, frost at sunrise; 6—Frosty rime. fine cool day; 7—Keen frost, with ice, afternoon changeable; 8—Several showers, very cold; 9—The same; 10—Heavy and smoky clouds, sunny gleams; 11—Gleams, heavy shower-clouds; 12—Fine; 13—Rime, finer, *lunar pale halo;* 14, 15—Raw dry days; 16—Fine day, wet evening; 17—First really spring-day, a shower; 18—Pretty fine, black vaporous clouds at sunset; 19—Cheerful spring-day; 20—Overcast, heavy masses, profuse rain in evening.

LUNATIONS.—New moon, 1st day, 6h. 33m. afternoon. First quarter, 9th day, 7h. 2m. morning. Full moon, 15th, day, 10h. 35m. afternoon.

REMARKS REFERRING TO AGRICULTURE.—Vegetation, though retarded, is very fine, and the progress of wheat, rye, tares, peas, and clover has been urged on by the few warm days last past. Rain has come in volume again in the afternoon of the 20th and 21st. Little of spring-corn has been sown hereabout. We hope the best; but experience speaks unfavourably for our hopes.

J. TOWERS.

Croydon, April 21.

CALENDAR OF HORTICULTURE.—MAY.

Retrospect.—At the end of the April calendar some remarks upon the existing state of the weather on the 21st of March were made—certainly not very cheering. The vernal equinox had occurred at that precise day; and upon the ground of experience, and of good authorities, we felt justified in endeavouring to excite observation, in order to confirm or disprove a theory which was based upon equinoctial influences. They who look over the meteorological diaries of March and April, and compare them with notices taken in other localities, will be able to form some notion of the existing prospects. A very great volume of rain fell between the 17th and the 31st of March, insomuch that certain meteorologists estimated the measured amount of water at several decimal fractions above five entire inches. April also, to the 16th, proved very cold, showery, and ungenial; so much so as to prohibit the seeding of spring corn. Thus, then, we may now register a month of chilling wet weather, which, after one of the mildest winters on record, has produced a late, instead of the anticipated early spring. Let us venture to hope that the prognostic has already been fulfilled; and that the volume of rain, instead of being spread over the harvest months, will have, at a most seasonable time, restored the balance of water which the ground had lost to a great depth, by the dry seasons of 1847, '49, and '50!

Vegetable Department.

1. *French and runner beans.*—The seeds of these vegetables having been sown in pans, under cover, should be immediately sown for successions, in the natural ground, in drills prepared some hours before, exposed to the full sun. This practice has been long recommended, because beans require a dry and warm bed to cause speedy germination. The young plants from the pans can be set out with similar caution, at any convenient opportunity. Sow the late *peas* by the first week.

Lettuces—These, on the contrary, like a moist, though not wet, bed. Choose a rich plot of open ground, thoroughly incorporated with manure, and plant in rows, ten or twelve inches asunder every way. Give and repeat occasional waterings. The smaller plants left where sown ought to be thinned to stand at several inches apart, to come in for salading.

2. Sow *lettuce*, endive, radish, small salads, twice, and some even more frequently, in the month. If May prove hot and drying, shady places must be chosen, and water be given as required. Pond water, derived from a stream that has passed through irrigated land, is peculiarly excellent, as it contains the best elements of manure.

Plant in nursery beds the cabbages, savoys, Brussels sprouts, borecole, kale, cauliflower, &c., raised by seed in February or March: place them at regular distances, to obtain strength and stocky roots.

3. Sow *cauliflower-seeds* after the 21st, for Michaelmas, to continue till November. Prepare a bed three or four feet wide in some warm border—not under shade: let the earth be mellow and carefully worked. Scatter the seeds of last year regularly; pat the surface, and rake it even. Do the same by the varieties of Cape broccoli. The young plants of all these should be pricked out in June, to obtain strength. Sow the true small green savoy and more borecole for the autumn: Chappel's colewort, for winter use, is now recommended. Sow *peas* of taller varieties for the final crop: if carefully treated as before directed, the tall marrows will bear till September.

4. *Plant* a good supply of cauliflowers in deeply-trenched and manured loam: prepare trenches thoroughly manured, and five or six feet apart, for the first crop of celery. Lettuces, spinach, or some cauliflowers may be planted between the trenches. Hoe, rake, earth-up, and stake peas: scatter air-slaked lime, to kill slugs wherever required; and fill up vacancies in rows of cabbage and other plants that will bear removal.

About the middle of the month sow *gourds* and *cucumber seed* over manure placed in a trench. *Vegetable marrow* can thus be grown, though it would be safer to raise the plants in pots, under cover of a frame with a gentle heat.

Capsicums and love apples (tomatos) which were raised in hot-beds can now be planted on warm borders with a south aspect—the latter against a wall, where they can be trained and supported.

Asparagus-cutting will commence: let every head, small and large, be taken, so that there be no irregular growth. If flavour, and not "pack-way" be the object, let no shoot be taken for the table till it rise green to the height of six inches.

Clean the spaces between, and thin carrots, parsnips, beet-roots, and onions. Top broad-beans that are in blossom, not only to promote the swelling of the pods, but to obviate the approach of that pest—the black aphis.

Sow or plant aromatic herbs, as directed in April; also garden mint. More celery may be sown, and young plants pricked out.

Sea-kale.—Remove the litter from the beds that have been forced: dress the surface with salt, sprinkled with care, to avoid the crowns, and fork the ground. *Rhubarb* plants that have been forced in pots can now be planted in the open ground.

HARDY FRUIT DEPARTMENT.

Apricots bear on spurs; therefore pinch or stop to a few buds the advancing shoots not required to fill vacant spaces: disbud, that is, nip close off redundant and ill-placed shoots.

Peach and nectarine.—Treat these in a similar manner, removing back shoots—most of the fore-right, unless such as show fruit at the base: when these should be cut back to three leaves. The well-placed true laterals ought each to provide a good successional shoot, arising from the bottom of the present bearing shoot: all or most of the others must be removed, excepting the one at top as a leader, to maintain the flow of the sap, and draw nutriment to the young fruit.

Plums and cherries.—Treat these as the apricot, remembering that the Morello cherry bears chiefly on the young wood of the previous year, and therefore more of that must be retained than is done on the spur-bearers.

Apples and pears on espalier and walls; also the best open dwarfs.—Regulate the spurs, cutting back to three or four of the best-placed buds at the bottom, to prevent the formation of straggling stags'-horns. Begin to pinch off the side shoots of pear trees to a few inches, and continue this practice instead of cutting back long shoots in July.

Vines.—If trained in the fruit-tree order, stop the young laterals at one eye beyond the bunch, but leave the leader. If trained on the long rod system, stop the laterals of each rod, but preserve the one at full length which will be the bearer of next year.

Strawberry plants should be well supplied with water: after a soaking rain the ground ought to be covered with long litter, fern, or a good coating of tanners' bark that has stood some time in heap. Put this down with the spade, as thereby moisture will be retained, to the great benefit of the bloom and fruit.

Currant and gooseberry bushes are apt to lose some inches of the shoots which were last pruned. In such cases, use the knife behind, and in the slope of an advancing shoot: thus the figure of a bush may be retained, and a deformity removed.

The advancing shoots of grafted or budded trees ought now to be secured, to prevent accidents from wind.

FLOWER GARDEN AND SHRUBBERIES.

The season for laying out and furnishing these, in their several departments, approaches. Every one must follow out his own individual taste as to arrangement in respect of colours and massing. The numbers of species and varieties are so immense that we shall not attempt to particularize; but there are a few general remarks which claim attention. In ordinary seasons frosts are supposed to have passed away by the 16th day; but the year is then so far advanced that many gardeners in large places are constrained to plant at a venture within the first week of May. If geraniums, verbenas, and such-like stock have been duly hardened off in frames and cold dry pots, exposed as much as possible to the air, they may pass through any moderate ordeal of cold in tolerable security; but we must urge the facts that occurred at Dropmore, where in 1833 hundreds or thousands of plants for the parterres had been so cautiously treated for weeks, and watched by night till dawn of day, that even to the last security appeared to be certain. The night of the 6th was clear and cool, and the guardian of the frames remained at his post till about the third hour of the 7th day: then he ventured to retire: the sun was of course near rising: the thermometer receded several degrees: hoar frost covered the semi-hardy plants in the open frames, and by six o'clock hundreds were irrecoverably frozen! On the 16th or 17th of May in 1837 a snow-storm came on in the afternoon; the atmosphere cleared by sun-down, and in my garden the vine-shoots on a south-east wall, six to twelve inches long, were destroyed. What has been may occur again. Better delay a week than lose all by over haste. We know not what this year of change may produce; and the prognostic is very doubtful.

In my last I alluded to the neglect of good old favourites. One of these is the double *wall-flower*—the bright orange in particular. This and its family can be raised in May thus: Select slips four to six inches long, of the present season, green and juicy above, but rather robust below: take off the leaves rather more than half-way up from the bottom; twist the stalks a little at the lower part, then plant them about four inches in the soil of a shady border: firm the earth close about the slips—a hand-glass would assist—and I have little doubt that many would strike root in phials of water, if placed in very gentle heat.

Some other fine herbaceous plants are the stock gilliflowers, and the German varieties of stocks, carnations, cloves and pinks, rose-campions, larkspurs, double-rocket, and the fragrant dame's-violet, the rich crimson antirrhinums, peonies—the single for its elegant red seeds, the double, and the "tree" or Moutan; polyanthus, malope, sweet scabious, and all the varieties of hollyhock. Tastefully introduced on borders of miscellaneous plants, or in shrubberies among flowering shrubs, they would not fail to induce pleasing associations, and tend to shake the fashion for many new annuals which soon pass away, and produce unsightly litter.

In *pasture gardening*, the bedding-out system in masses cannot be surpassed: the effect produced is great and striking at all times.

The weather remains a source of solicitude. Three or four days were dry and thoroughly spring-like; but the wind veered by S.E. to S. and S.W., and copious rains have fallen yesterday and to-day. Five weeks nearly have elapsed since the wet season commenced; and the prospect is not encouraging. Time alone will determine events.—J. TOWERS.

April 21.

OPERATIONS FOR MAY.

FLOWER GARDEN.

Many of the spring flowering plants—a list of which was given in the Calendar for May last year—will now be in great beauty; and, as their adaptability, when profusely distributed, for enlivening the flower garden during a very dull period, is beginning to be better understood and appreciated, I would recommend increased exertions in the way of propagating, and to prepare immediately a number of good beds in the reserve garden in readiness to receive them when the season of their blooming is past, which is the best time to separate and divide them into small pieces, and by such means increase the stock. See that a suitable supply of composts for the various purposes of the flower garden is in readiness, particularly for vases and ornamental flower-pots and baskets. If convenience will serve, some may be planted about the middle of the month, and kept in for a short time.

Herbaceous Plants.—Many of the choicer and most delicate sorts will be best propagated at this season, either by small offsets in the reserve garden, or by cuttings under a handglass. Seeds of these plants, both perennial and biennial, should be sown immediately.

Rose Garden.—Go over the whole stock, and remove all superfluous buds. A few may be left, in order to be cut back within an eye or two at the end of the month, to produce an autumn bloom. Look out for the rose weevil, and keep down aphides by fumigation or syringing with diluted tobacco water, or clear lime water.

Bulbous Plants.—All of these which require removal should be taken up as soon as the leaves begin to fade, and stored in a dry airy shed, and the beds dressed and prepared for bedding plants.

Annuals.—Continue to prick out the *Tender Annuals* from the main sowings, as they require it. A brisk bottom heat with abundance of air brings them on well. The last week in the month is soon enough to transfer them to their final situations. Continue to sow *Hardy Annuals*, and thin out all which are now above ground; amongst which, *Stocks*, of various kinds, will require particular attention in timely thinning, and the whole must be well guarded from the attacks of slugs, by occasional dressings of soot, lime, and ashes, which mixed in about equal parts produces a grey mixture which is not offensive to the eye.

Florists' Flowers.—Turban and other ranunculus and tulip beds should be shaded from powerful sun and protected from cutting winds. Beds of pinks and carnations should be surface-stirred, and occasional applications of liquid manure made; they will also require support as they advance in growth. Lay a few traps for earwigs about the beds, and examine them regularly.

Pansies.—Keep the surface stirred as far as practicable, and secure the young growth by pegging down. Prepare beds for seedling calceolarias: they flower best on a north border, but they like the morning and evening sun.

Bedding Plants.—Lose no time in getting these into a properly hardened condition for final planting out, which operation may be commenced late in the month, beginning with the verbenas, but do not be in too great a hurry. I have seen several beds of scarlet and other geraniums cut down by frost on the 30th of May, so that, in most localities, I would not venture the tenderest things until the first week in June, at which time every hand should be brought to bear on the job, and it can soon be got over. Where there is a great extent of bedding out, the principal operator should have a plan for constant reference, so that there shall be no hesitation as to the whereabouts of this or that set of plants when the work is about. Harden off the Marvel of Peru, and plant out the second or third week. Plant out the tall Lobelias in beds well manured, and give plenty of water. They should be edged with the small trailing kinds, as ramosa, maxima, and erinus grandiflora. Remember to secure a good stock of climbers for iron and wire trellis works, such as Rhodochiton, Lophospermum, Maurandya, and Tropæolum. Zauschneria californica is quite hardy, and a very abundant bloomer in a warm situation. The general stock of dahlias may be got out towards the end of the month.—J. W. C.

CONSERVATORY.

See that all the conditions necessary for growth are maintained; plenty of moisture both at root and top is indispensable. Next season's bloom of Camellias and Rhododendrons will depend almost entirely on their treatment during this month; it will not do to put them away in dark out-of-the-way places as soon as they are done blooming; they ought to be placed in the very brightest parts of the house, and the plants in bloom put in the darkest places, there they will both last much longer and be seen to more advantage, especially the white and light-coloured ones; it is best not to shift Camellias till they have partially matured their shoot, as they do not make much root till after they are done growing. If there is an intermediate house, Azaleas should be shifted at once, and kept moist by syringing twice a day, and encouraged to grow as rapidly as possible; by this mode of treatment they will come in early next spring with very little forcing.

Continue to make notes of such plants as are likely to come in for special purposes next year, and treat them accordingly; keeping in mind that those forced early this season will come in at the same time next year, with little or no forcing, if attention has been paid to their getting an early growth. If there has been any neglect in watering the planted-out specimens the sun will let out the secret now; if any of them shrink from the sun and refuse to grow, examine them at once carefully, it will sometimes be found that one side only is dry, while the other is wet; if such is the case measures must be taken to confine the water to the dry part till it is thoroughly saturated, this may be done by a little bank of clay and loosening the dry part well with a fork, and do not leave off till you are satisfied that the water has penetrated every part of it; if the soil consists of a good portion of peat it will require a large quantity of water.

Stove.

Where this is really a plant stove, and not also a forcing house for other plants, a high temperature and abundance of moisture ought to be maintained now. Examine the tan pit (if by such means you get bottom heat), and add some fresh materials if the heat declines. All plants that are from any cause unhealthy, or got bad roots, should be plunged in the tan at a temperature of about 90; however, if making roots alone be the object (and it certainly ought to be), a good dung bed at the above temperature with the top of the plants in an atmosphere of about from 50 to 60, will be perhaps the surest way to attain the object. It ought to be borne in mind that plants generally do not make roots and branches at the same time, and that a plant with bad roots cannot make good branches, hence the importance of first getting good roots. Some time during the month, according to the weather, a selection of plants should be made here: such sorts as would grow too fast if kept here during the summer, should be taken to a house where the temperature is lower: this applies principally to the winter flowering things so often referred to. The geranium will now luxuriate in a light house, a high temperature, and plenty of moisture.

Greenhouse.

Where there is not a house on purpose for Azaleas bring them in here, when past flowering in the conservatory; indeed the whole collection of plants ought to be selected to come in succession to each other. All the young stock of hard-wooded plants will be much better in a cold pit from the first of this month. Large plants of Epacris, &c., that have done blooming, ought to remain here till the first of June, when a sheltered place in the open air will be more suitable. Continue to shift Fuchias, Chironias, Euthalis, Cestrums, and a host of such things for autumn flowering. A few strong plants of Campanula pyramidalis, blue and white, dug up and potted now in large pots will be very useful by-and-by. Salvias splendens and S. gesneriflora ought to be encouraged by every available means—also Chrysanthemums. Some seeds of Chinese Primrose and Cineraria ought to be sown towards the middle of the month.

Heath House.

Keep still shifting young plants as they seem to require it; where there is a good collection of this genus, and it is desired to have them in first-rate condition, there is not a month in the year that some one of them will not be benefited by a shift; however, as plants generally make fewer roots about Midsummer than any other time, it will be prudent not to shift any for the next two months except such as are getting full of roots, and give a smaller pot now than in spring or autumn. All the hard wooded and more delicate sorts, if not already removed, should be taken at once to a cold pit for the summer, the lights kept over them during hot sun, and tilted on one side that they may have plenty of air, and shaded for three or four hours during hot sunshine in the middle of the day; but on all occasions when the weather is dull and mild, without rain, the lights ought to be kept off both night and day. Look well for mildew, and dust with sulphur immediately it appears. Note the merits of the several sorts as they come into bloom with the dates; this carefully done for a twelvemonth will enable any one to make a selection to suit his purpose, either to have a few in bloom at all times, or in cases where the family reside only certain months at the place, the selection might be so made that the whole collections should bloom during that time, whatever time of the year it might be.—R. R.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR APRIL.

Although we have had numerous, and frequently most sudden changes in the temperature, some progress has been made by vegetation; nevertheless, the season, taken as a whole, must be considered backward. The heavy and almost continuous rains which fell in most parts of the United Kingdom towards the close of March materially retarded the sowing of spring corn; yet, at the present time, most out-door farm labours are tolerably forward, especially on light lands, which have suffered less from excessive moisture than in most wet springs. Notwithstanding the comparative mildness of the weather during the winter months, the autumn-sown wheats are looking strong and healthy; whilst the young plants are well above ground, and give promise of a good return. It is much to be regretted that numerous farmers—from, doubtless, force of circumstances—have planted unusually large breadths of potatoes; which crop, we are given to understand, paid them much better last year than either wheat or barley. That its produce was unusually large, passing events have fully demonstrated. Not only have the supplies brought forward during the whole of the winter been exceedingly large, but their quality has turned out unusually good: whilst the imports from the continent since the commencement of January have been under 1,000 tons. As might be expected, the stocks on hand have become much reduced; hence, selected samples are now held for rather more money, some of them having realized 100s. per ton; but the trade must be considered depressed, in consequence of the great abundance of green vegetables, and the extremely low value of bread, inferior qualities of which are now selling in the metropolis as low as 4½d. per 4lbs. loaf.

The continuous arrival of flour from France has had a most depressing influence upon the corn trade, and prices of that article, as well as wheat, have tended downward. In spring corn a fair average business has been transacted, whilst nearly the whole of the warehoused and fresh imports of Indian corn have changed hands, chiefly for shipment to Ireland, at comparatively high rates; 33s. per 480lbs. having been paid at Liverpool for American yellow. That the prospect of the trade as respects prices is most unsatisfactory must be evident to all parties; as it is clear, notwithstanding the large quantities of flour shipped to the United Kingdom during the last six months, that the stock of grain in France is very large for the time of year. In the early part of the month rumours were afloat to the effect that the French government contemplated the purchase of large supplies of wheat to store up for future consumption. This had the effect of raising the pretensions of growers and speculative holders, and prices of flour improved two francs per sack in the Paris market. As the arrangement in question has not been carried out, from obvious reasons, viz., the diminished resources of the treasury, the above advance was speedily lost; consequently, almost unlimited purchases have been effected at ruinously low figures, and which have caused no little dissatisfaction, and, we may add, distress amongst the agricultural body. As respects the stock of wheat of home growth held in this country, we may observe that our accounts agree in stating that it is seasonably good; whilst the weekly sales this year have been fair average ones. The supply of barley, oats, beans, and peas in most of our large districts is very small; and we may conclude that large importations will be necessary to prevent any rise of moment in the quotations. Hitherto, we have drawn the bulk of our foreign oats from the Danish Islands; but the increased breadth of land under oat culture in France last year has afforded us extensive quantities from that country, but which, from their foul and dirty condition, have changed hands at very low prices.

Most of the crop grasses have now been sown, but the heavy state of the land in some localities has prevented anything like a good tilth.

The scarcity of grass has produced rather an important rise in the value of hay. In some instances meadow hay has sold as high as 90s. per load. Straw, however—which has come freely to hand—has commanded very little attention. The general appearance of the potato fields gives earnest of a good crop.

Our letters from Ireland and Scotland state that much inactivity has prevailed in the corn trade. The fall in prices has not been serious, although the imports of foreign flour have somewhat increased.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

On reference to our returns, it will be perceived that full average time-of-year supplies of home-fed stock have been exhibited in Smithfield since the date of our last review; and it has been a general observation that those of beasts have come to hand in unusually prime condition. Those of sheep, however, have been chiefly composed of tegs; but by far the largest portion have turned out extremely well as respects their weighing qualities. Notwithstanding the comparatively low prices, not only in the metropolitan, but likewise in the large consuming markets, the imports of foreign beasts, sheep, calves, and pigs have increased to some extent: and judging from the stimulus given to the trade by English gold, and the large number of additional steamers about to be placed upon the various stations, we have no hesitation in saying that the arrivals from Holland, Denmark, and elsewhere during the present year will considerably exceed those of all previous seasons. This circumstance will, doubtless, exercise considerable influence upon the value of store animals in this country, and consequently tend further to deprive our graziers of anything like a fair return for the investment of capital.

Notwithstanding that accounts have reached us from some localities to the effect that the past has been a very indifferent lambing season, we have every reason to believe that the total fall has not been beneath an average; and it is gratifying to be enabled to observe, that whilst the supply of food has continued abundant and cheap, the stock, generally speaking, has remained tolerably free from disease. The continued damp weather has, in some instances, acted prejudicially to the sheep; yet scarcely any serious cases of rot have been referred to by our correspondents.

In the early part of the month the quotations of sheep and calves had an upward tendency, but the increasing receipts since the 14th have tended to depress the quotations to beneath their former level. In the value of beasts, lambs, and pigs no material change has taken place. Contrary to usual custom, during the season of Lent, the arrivals of country-killed meat up to Newgate and Leadenhall have proved unusually large, and we need scarcely say that very heavy losses have been sustained by the owners. The fact is, that hides and skins are worth more in some of the provinces than in London; whilst rapid communication has tended greatly to increase the traffic, more especially since the Great Northern has been opened, and which has given great facilities to those residing in Lincolnshire.

The following supplies have been on offer in Smithfield:—

	Head.
Beasts	16,674
Cows	304
Sheep and lambs	108,824
Calves	1,152
Pigs	2,510

CORRESPONDING PERIODS.

	April, 1848.	April, 1849.	April, 1850.
Beasts	15,322	16,678	16,765
Cows	577	520	414
Sheep and lambs	82,310	110,070	97,920
Calves	1,375	1,178	1,299
Pigs	2,818	1,840	1,900

The past month's supplies have been chiefly derived as under:—

	Head.
Norfolk, Suffolk, &c.	9,200
Other parts of England	1,700
Scotland	1,288
Ireland	20

COMPARATIVE PRICES IN SMITHFIELD.

(Per 8lbs., to sink the offal.)

	April, 1848.						April, 1849.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, ...from	3	2	to	4	8	..	2	0	to	3	6
Mutton	3	6	to	5	6	..	2	4	to	4	2
Lamb	5	8	to	7	0	..	5	0	to	6	4
Veal	4	0	to	5	2	..	3	2	to	4	2
Pork	4	0	to	5	0	..	3	0	to	4	2

	April, 1850.						April, 1851.				
	s.	d.		s.	d.		s.	d.		s.	d.
Beef, ...from	2	4	to	3	6	..	2	2	to	3	8
Mutton	3	0	to	4	6	..	3	2	to	4	6
Lamb	3	8	to	5	8	..	4	10	to	6	0
Veal	3	0	to	3	8	..	3	0	to	4	0
Pork	3	2	to	4	0	..	3	0	to	3	10

The imports of foreign stock into London have amounted to 2,041 beasts, 6,981 sheep, 1,106 calves, and 161 pigs. The total supply received during the corresponding month in 1850 was 4,667; in 1849, 3,810; in 1848, 5,391; and in 1847, 5,826 head.

A very inactive trade has been experienced in Newgate and Leadenhall on the following terms:—

	s.	d.		s.	d.
Beef ....from	2	2	to	3	4
Mutton	2	4	to	3	8
Lamb	4	8	to	5	10
Veal	3	0	to	3	10
Pork	2	4	to	3	10

REVIEW.

AN IMPROVED SYSTEM OF FARM BOOK-KEEPING.

LONDON: LONGMAN AND CO.

This work is well adapted for the use of farmers generally; there is much valuable information to be found in its pages, and it contains a most useful appendix of weights and measures, and tables for calculating the expense of dibbling, hoeing, draining, ditching, reaping, mowing, and all descriptions of task-work.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF APRIL.

Since we last addressed our readers another motion has been brought before the House of Commons by Mr. Disraeli, relative to the existing distress among all classes of agriculturists, which was negatived by a majority for Ministers of 13. The honourable gentleman is evidently not disposed to let matters rest here; but there appears little prospect of any substantial relief being afforded by the present Government to farmers. Their tenure of office is, however, in all probability, but short; and when they are again beaten, a general election must take place, an event which, come when it may, will decide the feeling of the country as to the desirableness of a longer continuance of the free-trade experiment.

We need scarcely urge farmers to be prepared for the coming contest. They now know, to their cost, that free importation of corn, and remunerative prices, are incompatible; that the assertions of the advocates of the new order of things, respecting the cost of production abroad, have been practically proved incorrect. We trust that the agriculturists will receive assistance from those engaged in other branches of trade; the conviction that it is not politic to encourage foreign industry at the expense of our own artizans having converted many who were once free-traders to more rational opinions.

Though our markets have certainly not held out much encouragement to importers of corn for some time past, still supplies have continued to flow into the country, and by the official returns it appears that during the first three months of the year the following quantities were entered for home consumption in the United Kingdom:—

	Month ending Feb. 5.	Month ending Mar. 5.	Month ending April 5.	Total.
Wheat	328,482	283,416	493,954	1,105,852
Barley	70,742	65,907	49,017	185,666
Oats	41,917	56,829	31,644	130,390
Rye	354	2,866	2,259	5,479
Beans	20,123	17,759	44,775	82,657
Peas	8,956	3,737	3,656	16,349
Maize	56,007	82,644	139,162	277,813
Flour	411,979	446,803	480,227	1,339,009

There has been a constant pressure on the different markets; and the home producer has been under-sold, to his serious injury.

Towards the close of the past month a slight rally occurred in the value of wheat, in consequence of the then unfavourable weather; since then, however, business has again become very depressed, and the greater part of the advance has been lost.

The average price for wheat for the kingdom has rather crept up; but this has been caused by the improvement which a fortnight of dry north-east winds wrought in the condition of the grain of last year's growth.

The future range of prices will be wholly regulated by the weather. Hitherto nothing has occurred to give rise to uneasy feelings respecting the crops on the ground; and merchants, millers, and and others are, therefore, by no means inclined to make addition to their stocks, past experienee having convinced them that, with open ports, supplies will always exceed what is likely to be required to satisfy the legitimate consumptive demand.

The sowing of spring corn, which was interrupted by the rain which fell during the last fortnight in March, was again resumed about the beginning of the present month, and may now be considered as finished. The seed has in general been well got in, and the warm showers which we have been favoured with since the 17th inst. must have proved very serviceable to vegetation generally.

The reports from the agricultural districts are, as far as the prospects relative to the crops are concerned, of a satisfactory character; but the complaints respecting prices are universal from all quarters. Spring corn has lately sold on relatively better terms than wheat; of this, however, farmers have unfortunately derived little benefit, as the stocks of barley and oats had previously been reduced into a very narrow compass.

The distress among the owners and occupiers of land is now so general that some of the organs favourable to free-trade have been compelled to admit its existence, and an article lately appeared in the *Times* newspaper acknowledging that, if matters were allowed to go on much longer as they have hitherto done, the bulk of the English farmers would speedily be ruined.

We shall now proceed to give a review of the fluctuations which have taken place at Mark Lane during the month. These will be found to have been but slight, and the general character of the trade has undergone so little change in the metropolitan market as to afford but scanty matter for comment.

The arrivals of English wheat into the port of London have been to about the same extent as the preceding month, averaging about 2,500 qrs. per week. The smallness of the home supply has, however, caused no inconvenience to the millers, who have been enabled to carry on their operations with the assistance of occasional small purchases of fresh thrashed samples for mixing with the foreign. Under these circumstances the sale of the former has, throughout the month, been slow. On Monday, the 7th April, there was a small show at Mark Lane by land-carriage samples from Essex and Kent, and though the condition was better than before, considerable difficulty was experienced in disposing of the supply at previous rates. During the remainder of that week scarcely any wheat was brought forward; and on the 14th there was again a very indifferent display of samples: the millers, nevertheless, acted on the reserve, and the commoner kinds of red were on that occasion parted with at a decline of 1s. per qr. Since then the tendency of prices has continued downwards; but no quotable change was reported until the 28th, when a reduction of 1s. to 2s. per qr. was generally submitted to.

The arrivals of wheat from abroad have been less plentiful than in any preceding month for a considerable time past, and the quantity afloat at this port on board ship has consequently been a good deal diminished; having, however, rather heavy granaried stocks, and holders of the same being perfectly aware that no great length of time will pass without bringing fresh supplies, sellers have been rather anxious to profit by the temporary break in the receipts to realize as far as practicable. Most of the large town-millers being still well provided with foreign wheat, and the country demand having at no period of the month been active, extensive transactions have been altogether out of the question; there has consequently been no inducement to take less money, and the purchasers from hand to mouth have had to pay similar rates for good qualities as those current when we last addressed our readers. In this position of affairs it is scarcely necessary to particularize; but we may, as a general remark, state that buyers have on the whole been able to do better towards the close than in the beginning of the month, which has no doubt been partly caused by the prevailing belief that more plentiful supplies are close at hand. There has been much less business done in free-on-board cargoes than was the case in March. Of Polish Odessa, Danube, and similar qualities of wheat, there have been comparatively few offers, which has caused sellers to ask higher rates than buyers have been disposed to give, as much as 35s. per qr., cost and freight, having been demanded for superior parcels of Polish Odessa. The advance which took place in the Baltic market about the latter end of March has also had the effect of checking business, the offers from that quarter having been at rates out of proportion to the value here; the subdued tone of our advices since then will probably have the effect of rendering holders abroad more reasonable; but hitherto quotations are relatively lower in our markets than on the continent.

Continued and regular supplies of foreign manufactured flour have reached us, the arrivals from France having exceeded 40,000 sacks at this port, during the month. The sale of home-made flour has been rendered very difficult by the pressure of foreign on the market; the nominal top price of town-made has been put down lately by most of the principal millers to 38s. per sack, and quotations of other sorts have given way in the same proportion. The millers were, as a body, favourable to free trade previous to its introduction; but they have since found out their mistake, and are now very desirous of obtaining a protective duty on the manufactured article.

Barley of home growth has come very sparingly to hand. In the early part of the month, when the weather was cold, the maltsters were rather free buyers of the finer kinds of barley; but since the temperature has risen, many have left off work for the season, and the inquiry has consequently within the last week or two slackened. So trifling, however, have been the supplies, that the falling off in the demand has failed to produce any effect on prices; and we consider quotations quite as high as they were at the close of March. The arrivals of this grain from abroad have not been by any means large; the total supply during the four weeks ending 26th inst. having amounted to only 13,000 qrs. In addition to a good local inquiry, we have had a fair country demand, and sellers have consequently asked rather enhanced terms. Egyptian barley of very light weight has realized 18s. to 18s. 6d.; inferior Baltic, 20s.; and really good heavy samples of the latter 21s. to 22s. per qr., and in some cases even higher rates. The recent advance in barley in this market has caused a good many orders to be sent out to the North of Europe, and we are inclined to think that the effect will be to draw rather large supplies from the continent.

There has not been much passing in malt during the month: the receipts of the article have been moderate, and fine qualities have been rather scarce; still sellers have found it difficult to establish any quotable advance, and prices are much the same at present as they were at the close of last month.

The market has been scantily supplied with English and Scotch oats; nor have the receipts from Ireland been by any means large; and prices would probably be higher than they now are, had we not received good supplies from abroad. Altogether about 55,000 qrs. of foreign oats have arrived at this port during the month; in the early part prices showed a decided tendency to advance, still little if any actual rise was established, and the extent of the foreign supplies began to influence business on Monday, the 14th inst., when a decline of 6d. per qr. was pretty generally submitted to. This small reduction has since been recovered, and quotations are now fully as high as at any period of last month. Good feed oats, whether of home or foreign growth, have lately brought 19s. to 20s., and the finer kinds 21s. to 22s. per qr.; indeed, for fine Scotch the latter price has been exceeded. That stocks of oats are very small in all parts of the kingdom, and that considerable imports of foreign will be required before another harvest can be secured, is certain; and we are more disposed to reckon on a further improvement than on any reaction in prices of consequence.

English beans have come very sparingly forward; and though the demand has not been by any means active, the insignificance of the supply has enabled factors to realize full terms, and really fine qualities have brought rates which it would have been difficult to have realized last month.

Egyptian beans have been in steady consumptive request, but there has been no disposition to make speculative purchases, and prices have remained in precisely the same position they were when last we addressed our readers.

The arrivals of peas coastwise and from abroad have been small. Having, however, still good stocks of foreign in granary, sellers have been unable to obtain the least improvement on previous prices. Grey and maple peas have sold more readily than white boilers, the former being less interfered with by foreign supplies than the latter.

We have had constant inquiries from Ireland for Indian corn afloat; but owing to the paucity of offers, comparatively few bargains have been closed. During the first fortnight in March scarcely anything was done, and prices became almost nominal. About the end of the third week a good many vessels, laden with this article, arrived off the coast, the greater part of which have since been ordered to proceed to Ireland, and the market has again become bare of free-on-board offers. Fine Galatz has brought 31s. per qr. cost and freight, and other descriptions have sold at proportionable rates. The consumption of Indian corn is evidently extending in the sister isle, but in England it is but little used as human food, and its price being too high to allow of its being employed for cattle feeding, nearly all that is imported into the United Kingdom finds its way to Ireland.

The slight advance which took place in the value of wheat in our markets during the latter part of last month caused a good deal more excitement at the principal Baltic ports than was warranted by the temporary character of the improvement; but the fact is, that Baltic merchants still reckon on an extensive English demand, and do not make sufficient allowance for the altered position of affairs since the introduction of free trade. The stimulus which has thereby been given to agriculture in France, and the regular supplies which she has sent to Great Britain the last two years, have rendered us in a great measure independent of the north of Europe. The increase in the shipments from Odessa and other Black Sea ports, where prices have all along been comparatively lower than in the Baltic, have tended to have the like effect; but these facts have hitherto been overlooked or disregarded by merchants at Danzig, Rostock, &c., who have held their wheat so high as to render the execution of the orders from time to time transmitted from hence very difficult. This is, however, not likely to last, and we repeat what we have on former occasions asserted, that if nothing should take place to give rise to apprehension in regard to the crops, quotations will speedily be reduced all over the continent, and the surplus growth of the different countries will in the end be sure to find its way to Great Britain.

By the latest advices from Danzig we learn that good supplies of wheat having arrived from Lower Poland, sellers had become more disposed to deal, and that several purchases had consequently been made in execution of English orders. The quality of the new Polish wheat is described as better than expected, though decidedly inferior to the growth of some preceding years. Fine high-mixed parcels, weighing 61 lbs. to 62 lbs. per bushel, had brought 39s. to 41s.; good high-mixed, of 60 lbs., 37s. 6d. to 38s.; good mixed, of the same weight, 37s. per qr. free on board; and inferior sorts, weighing 58 lbs. to 59 lbs., 34s. to 35s. per qr. free on board. Old wheat in granary had been held relatively higher, and few bargains had conseqnently been closed: the only purchase referred to by our correspondent is a parcel of fine high-mixed, taken for shipment to London at a price equal to 42s. per qr. free on board. Freights were low, say 2s. 10½d. to 3s. to London; 2s. 4d. to Newcastle; 2s. 6d. to 2s. 9d. to the East Coast; and 3s. to Liverpool.

At Konigsberg the operations in wheat appear to have been on quite a retail scale, the rates asked having been above the limits of the few export orders received. Barley and oats had, on the other hand, been much inquired for; owing, however, to the smallness of the supplies, the transactions had not been extensive.

From Stettin we learn that the supplies of wheat from the farmers had been of a moderate character; which was, however, attributed to the fact of growers having been busily engaged with spring sowing. In the early part of the month a considerable amount of business was done, several cargoes having been bought on English account; for good red Silesian of 61 lbs. weight, 34s. 6d. to 35s. 6d., and for the best Pomeranian and Uckermark, 36s. 6d. to 37s. 6d. per qr. free on board had been realized. These rates were subsequently no longer obtainable, owing to the less encouraging accounts from hence having had the effect of checking the disposition to buy. Barley seems to have been much sought after, and the supplies having scarcely kept pace with the local demand, we are not likely to receive any great quantity from thence: equal to 18s. 6d. per qr. free on board had been paid for moderately good qualities, weighing 52lbs. per bushel, and 19s. to 19s. 6d. for the best.

Most of the orders for red wheat hitherto sent out from this country have been directed to Rostock, and prices have therefore been run up at that port higher than elsewhere. The merchants there certainly did not require this stimulus, as they have all through the winter manifested a disposition to speculate, and it will probably be some time before quotations again recede to the point from which they have advanced. The very best qualities in granary weighing 62½lbs. per bushel were at one period quoted as high as 39s. per qr.; since then, however, sellers have become more practicable, and the latest advices state that very good wheat, of the weight named, had been sold at 37s. to 38s. per qr. free on board. Barley was nearly as dear there as at Stettin, and it would not be an easy matter to secure any quantity, even at 18s. per qr. free on board, in that quarter.

At Stralsund, Anclam, Greifswald, &c., prices of wheat have risen 1s. to 2s. per qr. from the lowest point, but at neither of those places has the maximum reached so high as at Rostock. At Hamburgh the value of wheat likewise underwent some improvement in the beginning of the month, and though it has since receded, still prices were rather higher at the date of the latest advices from thence than they were at the close of March, good red Upland, of 61½lbs. weight, being quoted 39s. per qr. on the spot, whilst for cargoes to be shipped from outports, prices varying from 35s. to 38s. had been asked.

A considerable amount of business has been done during the month, at Hamburgh, in barley, at enhanced rates, principally for shipment from the Danish Islands to Great Britain; the rates paid have varied from 18s. 6d. to 20s. for 53lbs. to 54½lbs. qualities. For Saale barley on the spot, weighing only 49lbs., as much as 21s. per qr. free on board had been given. The offers of oats had not been numerous, and 15s. per qr. had been paid for feed, of 38lbs. to 39lbs. weight, free on board.

In the Dutch and Belgian markets very little business has been done in wheat for export: still occasional shipments for England have been made. Barley is too dear in those countries to allow of consignments to the British markets, and prices of oats have been run up so high that it may well be questioned whether the parties concerned will derive any advantage from the purchases which have been made at Groningen, Emden, &c., during the last few weeks.

Our notice of the French markets need not be very lengthened. A temporary rise occurred the first week or two in April at some of the ports on the coast, in prices of wheat: this has, however, since been lost, and the article may now be bought on as easy terms in France as previous to the advance. Flour has all along been dull of sale, the supplies having been so liberal as to cause an increase to take place in stock, notwithstanding the large shipments to this country.

Oats have lately risen at several of the near French ports, in consequence of purchases on English account.

In the American markets very little change has taken place in prices and quotations of wheat and Flour are relatively higher on the other side of the Atlantic than in this country. There were consequently but few shipments of bread-stuffs being made for Great Britain, though freights were low.

CURRENCY PER IMPERIAL MEASURE.

Shillings per Quarter.

Wheat, Essex and Kent, white, new..	37	to42	fine up to	48
Ditto ditto old ..	40	44	„	48
Ditto ditto red, new....	35	40	„	42
Ditto ditto old	38	40	„	43
Norfolk, Lincoln, & Yorksh., red, n.	32	37	„	40
Ditto ditto old..	38	40	„	42
Ditto ditto white, new	38	40	„	44
Ditto ditto old..	40	42	„	44
Barley, malting, new........................			23	25
Chevalier, new			30	31
Distilling, new			22	24
Grinding, old		18	21	22
Malt, Essex, Norfolk, and Suffolk, new	43	45	extra	47
Ditto ditto old	44	47	„	49
Kingston, Ware, and town made, new	50	53	„	55
Ditto ditto old	48	54	„	56
Oats, English feed, new..............	16	18	fine	21
Potato, old	18	21	extra	23
Scotch feed, new	19	22	fine	22
Ditto, old	19	22	extra	24
Rye	24	26	old 23	25
Beans, Mazagan	24	25	„ 25	27
Ticks......................	25	26	„ 27	29
Harrow......................	25	27	„ 28	31
Pigeon	27	29	„ 29	32
Peas, white boilers..............	26	28	„ 26	28
Maple	26	28	„ 27	29
Grey	25	27	„ 27	28
Flour, town made, per sack of 280 lbs.	—	—	„ 33	38
Country marks..............	—	—	„ 27	31

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's *Gazette*.		Av.		Averages from the corresponding *Gazette* in 1850.		Av.	
	Qrs.	s.	d.		Qrs.	s.	d.
Wheat ..	85,653 ..	39	5	Wheat ..	78,261 ..	37	10
Barley ..	34,084 ..	24	5	Barley ..	36,015 ..	22	8
Oats	18,023 ..	17	5	Oats	19,020 ..	15	3
Rye	78 ..	24	7	Rye	163 ..	21	6
Beans	5,551 ..	26	10	Beans	5,784 ..	23	9
Peas	630 ..	25	9	Peas	720 ..	24	9

IMPERIAL AVERAGES.

For the last Six Weeks.

	Wheat.		Barley.		Oats.		Rye.		Beans		Peas.	
Week Ending:	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Mar. 15, 1851..	37	2	23	1	16	6	23	8	25	6	25	8
Mar. 22, 1851..	37	5	23	3	16	9	22	8	25	8	25	9
Mar. 29, 1851..	38	1	23	7	16	7	28	5	25	7	24	6
April 5, 1851..	38	4	23	10	17	0	23	11	25	11	24	8
April 12, 1851..	39	0	24	2	17	5	24	7	26	4	25	6
April 19, 1851..	39	5	24	5	17	5	24	7	26	10	25	9
Aggregate average of last six weeks	38	3	23	9	16	11	24	7	26	0	25	4
Comparative avge. same time last year	38	0	23	2	15	1	21	11	23	10	25	2
Duties........	1	0	1	0	1	0	1	0	1	0	1	0

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 60s. to 65s.; crushing 48s. to 52s.
Linseed Cakes (per 1,000 of 3 lbs. each).. £8 10s. to £10 0s
Cow Grass (nominal) ....£— to £—
Trefoil (per cwt.) ....16s. to 21s.
Rapeseed, (per last) new £25 to £27 ...... old £— to £—
Ditto Cake (per ton).................... £4 0s. to £4 10s.
Mustard (per bushel) white 6s. to 8s.; .. brown, 8s. to 12s.
Coriander (per cwt.)............................ 16s. to 24s.
Canary (per qr.)........... new 40s. to 41s., fine 42s. to 43s.
Tares, Winter, per bush., 3s. 6d. to 4s. 3d.; Spring, nominal.
Carraway (per cwt.)........... new, 30s. to 32s.; fine 33s.
Turnip, white (per bush.) —s. to —s.; do. Swedish, —s. to —s.
Cloverseed .... red 48s. to 52s., fine 55s. to 65s.

HOP MARKETS.

BOROUGH, Monday, April 28.

Our market has varied but little since our last report —if any difference, rather less business is doing. In prices we have no alteration.

Sussex pockets..........	66s. to 84s.	per cwt.
Weald of Kents do.	70s. to 88s.	,,
Mid. and East Kent do. ..	84s. to 140s.	,,

POTATO MARKETS.

SOUTHWARK, Waterside, April 28.

We had several fresh arrivals from Yorkshire and Scotland the latter part of the week. Trade is so heavy, that we cannot quote any improvement in prices. The following are this day's quotations—

York Regents................	80s. to 100s. per ton.
Scotch	70s. to 80s.
Scotch Cups	60s. to 70s.
Cambridge and Lincoln Regents.	60s. to 80s.
French whites................	60s. to 70s.

WOOL MARKETS.

BRITISH WOOL.

LEEDS, April 25.—There continues to be rather more inquiry for English combing wools to supply the current wants of the manufacturers, and prices are firm and stationary at last week's rates.

LIVERPOOL, April 26.

Scotch.—There is still very little doing in laid Highland Wool, but stocks continue light, and holders firm in price. White is scarce also, and rather more inquired for. In crossed and Cheviot there is still little doing.

	s.	d.		s.	d.
Laid Highland Wool, per 24lbs....	9	0	to	10	0
White Highland do................	11	6		12	0
Laid Crossed do...unwashed	10	6		12	6
Do. do...washed	11	0		13	6
Laid Cheviot do...unwashed	11	0		13	0
Do. do.. washed	14	0		18	0
White Cheviot do... do.	22	0		26	0

Foreign.—The late imports have been principally from the west coast of South America, and notwithstanding the general dulness that prevails over the markets, the greater part have been sold ex-ship.

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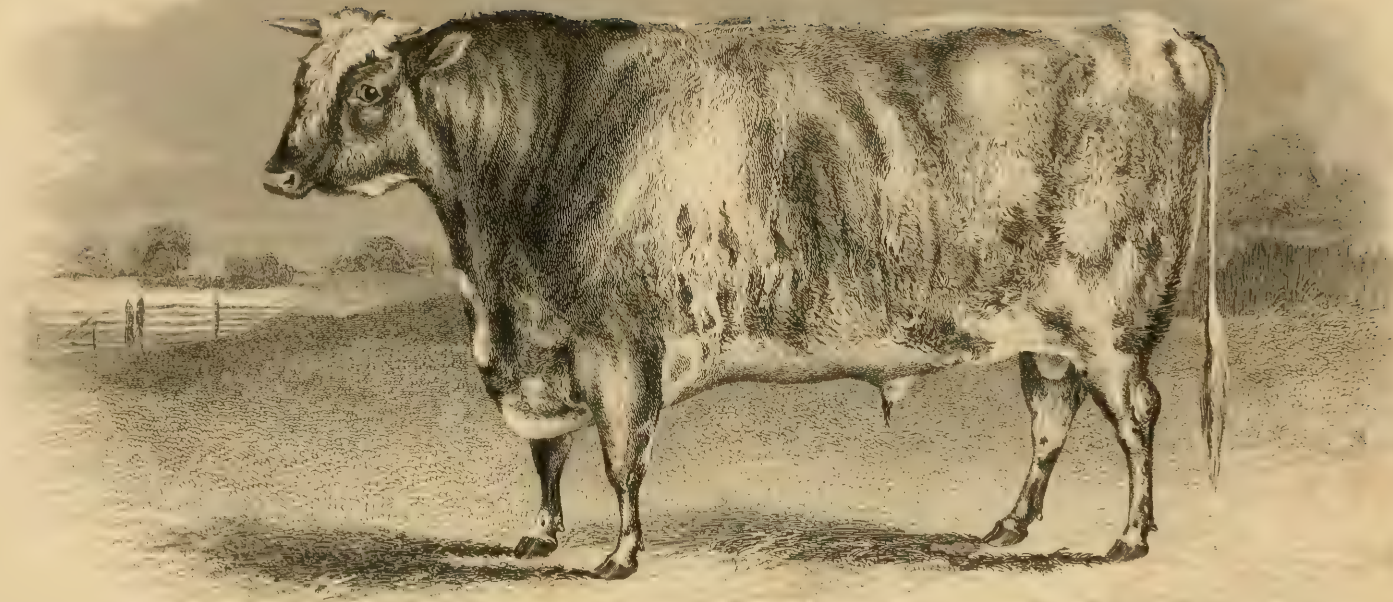

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THE FARMER'S MAGAZINE.

JUNE, 1851.

No. 6.—Vol. XXIII.] [Second Series.

PLATE I.

A SHORT-HORNED BULL,

The property of Samuel Wiley, Esq., of Brandsby, near York, for which the first prize of Fifteen Sovereigns was awarded at the meeting of the Highland and Agricultural Society of Scotland, held at Glasgow, in August, 1850. This animal "Van Dunck" was calved July 19, 1848; got by Vandyke (7669,) d. Eliza by Rumour (7456,) gr. d. Flavella by Belshazzar (1704,) gr. gr. d. Fairy.

Besides the above prize "Van Dunck" obtained a prize of Ten Sovereigns in Class 2, at the Yorkshire Agricultural Society's show, held at Leeds, in August, 1849; and at the Durham Society's show, held at Gateshead, in September, 1849. In 1850 this animal obtained the first prize of Twenty-five Sovereigns at the Yorkshire Agricultural Society's Show at Thirsk, as the best bull of any age.

PLATE II.

SOUTHDOWN RAMS.

The subjects of our plate, the property of William Sainsbury Esq., of West Lavington, Wilts, obtained the first and second prizes of Thirty Sovereigns and Fifteen Sovereigns, in Class 1, at the Royal Agricultural Society's show, at Exeter, in July last. Mr. Sainsbury had previously taken prizes at the Society's shows.

BONE MANURE, BONE PHOSPHATE, SUPERPHOSPHATE, &c.

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON, &c.

Some curious facts have lately come before the public; and now, while disclaiming useless repetitions, or appeals to authorities on the uses of bones in cultivation—subjects which have become matters of discussion in every accredited periodical—I venture to hope that the few remarks which I am induced to offer will not be found either irrelevant or void of interest. These will be introduced under the form of inquiry.

And first, at what period, or about what date, were bones first used? Second, when was that principle of animal bones which we now term bone phosphate—sub or two-thirds phosphate of lime—discovered, and to what chemical purpose was it applied? Third, under what other form is this phosphate found to exist?

1st. Bones, on an average of sorts in common use, may be understood to comprise—

	Parts.
Solid cartilage, gelatine, and oil ..	51·0
Phosphate of lime	37·7
Carbonate of lime	10·0
Phosphate of Magnesia	1.3
	100·0

The above 51 parts form the organic elements of bones, and to these, according to Worlidge, in 1669, and other writers of later centuries, were ascribed the chief efficacy of bones as a manure. So far, we may trace an idea of their partial utility through a period of 182 years. But what said Arthur Young when he made his northern tour in 1770? Turnips had then been long known, and partially cultivated, but it was found impossible to maintain the fertility of the land, still more so to carry on turnip culture, and it was then seen "that they were not grown at all on 150 out of 250 of the farms inspected." Thus, then, it may be safely inferred that the agriculturists of the period (only 81 years ago) knew nothing of the specific fertilizing quality of bones.

2nd. When, therefore, was that principle of animal bones discovered which is now termed bone phosphate? And here, without attempting to name any precise date in reference to a chemical fact, I am enabled, from personal knowledge and experience, to speak positively as to its practical application in chemistry. Sometime about the year 1790 the late Dr. Pearson was engaged in an analysis of the celebrated James's Fever Powder; this preparation (as appears from the *Phil. Trans.* 1791—quoted by Brande) he announced to consist of 43 phosphate of lime (from calcined hartshorn shavings) and 57 oxide of antimony. About the same period, Dr. Pearson described a chemical preparation called, in the first instance, soda phosphorata, and this salt soon became fashionable in medical practice under the name of tasteless purging salt. In the laboratory of my father, where most of the chemical salts of the day were first produced on the great scale, in a state of purity and comparative perfection, Dr. Pearson's Tasteless Salt was manufactured; and after the detail which will be given, in as few words as possible, I think it will be granted that the certain discovery of superphosphate of lime was effected about ten years before the termination of the eighteenth century.

Bones were distilled from iron vessels—not unlike the retorts employed in the gas works—in order to obtain the volatile liquor then called rough hartshorn, and the accompanying animal oil. The heat employed was so strong as to reduce the bones to the condition of animal charcoal; in that state of ignition, and they ceasing to yield any more volatile liquid, the stoppers were removed, and the bones raked out expeditiously, when, on coming into contact with air, they take fire, the flame continuing till the mass lost its carbon and became white. It now comprised the true bone phosphate, carbonate of lime, and phosphate of magnesia, &c., which constitute the earthy elements of animal bones. In operating in the great way, 2 cwt. of these bones, rendered very friable by combustion, were placed in a large open cylindrical tub or leaden vessel, having a guarded tap near the bottom. Water enough to cover the bones was added, allowing also for absorption, and an inch or more in excess. Strong sulphuric acid was cautiously poured over the surface, a man continuing to stir up the whole with a sort of wooden oar, till the effervescence produced by the extrication of carbonic acid from the carbonate of lime in the bones ceased. So far the phosphate of lime was undisturbed, and gypsum (sulphate of lime) was the product. More cold water was added if the mass became too thick to be easily moved, and then certain known weights of sulphuric acid poured in, till something less than half the original weight of the bones had been added. After thoroughly incorporating the whole of the material, they were left for a time, the stirring being repeated twice a-day, and water poured on as required, till a two or three inch stratum floated over the mass. In a few days this supernatant liquor acquired the tint of lemon juice, or pale cowslip wine; the substance of the bones being completely broken up to a kind of fine mortar. This fluid, and all that could be obtained by the tap at bottom, and by washings of cold water so long as any acid passed, was passed into a copper boiler of sufficient size, a fire kindled, and pure crystals of soda (carbonate of soda) added to a small excess.

Here we might stop, as enough has been stated to prove that superphosphate of lime had been discovered, and practically employed in the chemical laboratory, at a period so remote as 1791, and largely before the year 1795, when my father died. But it is in the power of any person to verify the facts stated, by burning a large hollow bone till it lose colour, breaking it up, and then treating it with about half its weight of strong sulphuric acid, diluted with water amounting to twice the weight of the bone. After standing, the liquor can be strained through a white paper filter, or conical calico bag, and then treated with crystals of soda.

To close in a manner more in keeping with the style of modern science, I quote a few lines from p. 240 of *The Elementary Chemistry*, by the late Dr. Fownes. "This beautiful salt—Tribasic phosphate of soda—is prepared by precipitating the acid phosphate of lime (obtained by decomposing bone-earth by sulphuric acid) with a slight excess of carbonate of soda. It crystallizes in oblique rhombic prisms, which are efflorescent. The crystals dissolve in four parts of cold water; the solution is alkaline to test paper."

When the soda is added to the hot acid superphosphate, a copious precipitation of phosphate of lime instantly takes place, and continues till complete saturation is effected; proving the fact adduced by Liebig and other modern chemists, that vitriolized bones yield to the soil not purely phosphoric acid and sulphate of lime, but the latter in the form of gypsum; also a phosphoric acid, chemically combined with a definite proportion of phosphate of lime. There is, as Brande expresses it, "a tendency of phosphoric acid to form a basic or sub-salt with lime," which, under favourable conditions, influences it to form—1st, a neutral phosphate; 2nd, a sub-phosphate, as in bones; 3rd, a sesqui, or one-and-half phosphate; 4th, a bi-phosphate, as which it is occasionally tried in some guanos; 5th, a superphosphate, called by Dr. Thompson quadriphosphate, represented atomically by one atom of lime and four atoms of acid. This combination possesses curious qualities. When fused in a crucible, a transparent glass is obtained, called glacial phosphoric acid. Here also it may be stated that more than 50 years since some china works in Staffordshire began to employ calcined bones as the basis of their transparent china. The practice is still continued at Tunstall, and we believe with eminent success.

3rd. The third inquiry—under what other form does phosphoric acid exist?—may be dismissed in a very few lines. Much has been written on coprolites, or, rather, coproliths—the term being derived from *kopros*, dung, and *lithos*, a stone (Greek)—since Liebig first mentioned them, I believe in 1839. 53 to 55 per cent. of phosphate of lime and phosphate of magnesia, equivalent on the whole to 25 or 27 per cent. of phosphoric acid, have been detected by several chemists in these petrified substances. The question I would put is this—Do they or can they, combined as they are with flint, and in hard conglomerate lumps, compete efficiently with those bone phosphates which we have at command? and does it appear probable that, economically, the farmer can apply them to his land with equal or greater profit and advantage? At present I may doubt the fact; but trustworthy evidence, founded upon accurate experiments, must decide.

HOW FAR IS IT POSSIBLE TO RECOVER EXHAUSTED LAND WITHOUT MANURE?

BY M. M. M.

There is not a better understood fact in agricultural science than this, that if we take off from a soil its fertilising qualities, and none are returned, it must by-and-bye become barren; and not only is this true in its widest and most extreme sense, but it is also equally true that the more you take away from a soil of the elements of the growth of plants, the greater will be the difficulty of obtaining the crop, and the smaller will be the produce of that crop year after year.

It is true, some soils will bear much more severe cropping than others. Either there has been a greater per-centage of the elements calculated to produce crops present in the soil at the commencement, or there has been a much greater depth of soil with the ordinary per-centage, which is, in fact, the same thing; and it only requires the plants to search deeper for the food which they had exhausted above, in order to obtain the quantity necessary to their growth and development.

Thus in a deep alluvial soil, where the surface only has been scratched for years, and may-be for centuries, and where the super soil is thoroughly exhausted of all the elements of crop-growing, while perhaps the sole of the plough has managed to make a firm pan a few inches below its surface, it is not necessary to manure at all: only break the pan and plough-up the fresh soil, all turnip disease and clover sickness and root-swelling of oats will be prevented. In fact, the soil below will contain a proportion of the food of plants suited to their wants; and hence on such soils it will not be necessary always to carry back the elements of which it is exhausted, because they are already present, only locked up from the plant, and liberated and brought within its sphere by the fact alone of deep cultivation.

But on poorer and thinner soils this process would be unavailing. The subsoil below is poorer than the soil above: to deepen here were only to add to the previous poverty, and hence the cultivator must hit upon some other mode of restoring fertility than mere deep cultivation. Nay, we have seen the mere deep ploughing of ordinary land operate against immediate productiveness, and have, for the time, exactly the opposite tendency.

But there are hundreds of means by which more or less of the missing elements are restored by natural processes alone; and though it may be necessary to modify crops, so as to be assisted by nature, still there are scarcely any of the known elements of plants which are not provided for their use in a greater or lesser degree in the wide field of nature.

If we first take ammonia—the symbol and vehicle of the nitrogen of plants, the staple of the wheat plant, and perhaps the real test of the fertility of a soil, other things being equal—of this Liebig is so certain, that he not only asserts its presence in the atmosphere, but declares that it exists in *all* soils in quantities more than sufficient to produce any crop of corn, or grain, or plants whatever.

Mülder questions this, it is true. He states that the atmosphere contains an accidental quantity only of ammonia, and "that it ought not to take any higher rank, as regards organic nature, than many other substances accidentally mixed in remote quantity with the atmosphere." But then the question naturally enough arises, is not this one of the compounds, which, being "accidentally" mixed with the air of the atmosphere, nature has provided to restore to worn-out soils the elements of which cropping has deprived them? Now whether the amount in the atmosphere be great or small—and it will be doubtless varying as to the dry or wet conditions of the atmosphere—there is no doubt but it is there, and from thence is supplied to plants by the soil, which has shown such very decided tendencies to absorb it. Now it is not at all material whether it is formed from the nitrogen of the atmosphere combining with the hydrogen of water, or whether it is derived from the decomposition of nitrogenous substances, so that it really comes there, and that it is also contained in the water of our brooks and rivers, and so in a greater or less degree is supplied to plants.

Carbon, again, of which as we shall show hereafter so much is abstracted from the soil, is supplied from the atmosphere, where it exists as an integral part of the air we respire, and which our respiration, combustion, and decomposition are constantly supplying; and also from the water of our rains and snows, which brings it down with it to the earth.

Hydrogen can easily be supplied from the water of springs, and from rain as well as from vapour.

Then again, even sulphur, which is liberated by combustion as sulphurous acid gas, will be condensed by vapour and descend to the earth, or will escape in the shape of sulphuretted hydrogen from decay of vegetable matter, and will be liberated, doubtless, by the earthquakes and the volcanic action of the mounts Etna, Vesuvius, and Hecla, to afford a never-failing supply: it will also be carried as dissolved sulphurets in the water of springs.

Chlorine will be supplied by the tempests, which drive the sea-spray for miles across the country*, and which thus afford a supply of the minerals which may last a generation.

Phosphorus also, that most necessary of all the elements of plants, will be supplied by the atmosphere by the accidental presence, if it is so pleased to be expressed, of phosphoretted hydrogen; but it is from the decomposition of the rocky particles of the soil that by far the greatest supply of the mineral elements of plants is to be obtained. Thus if we take the native rocks even of the deepest lying character, the granite, we shall find, that it is only necessary to allow these to disintegrate, and we shall have some very important food for plants provided. It contains—

Silica	74·00
Peroxide of iron	3·00
Alumina	12·20
Lime	0·22
Magnesia	0·45
Potash and soda	9·33
Fluoric acid and water	0·50

Here are at once the very elements of success in plant growing—potash, soda, lime, and magnesia, and the first named in as large a proportion as nearly ten per cent.

If again we take basalt, we have these constituents—

Silica	53·70
Alumina	25·41
Lime	4·55
Magnesia	1·37
Oxide of iron	8·95
Sulphuret ditto	Traces.
Water	4·30

If we take sandstone again, we have—

Silica	54·34
Peroxide of iron	3·90
Alumina	4·35
Carbonate of lime	30·00
Carbonate of magnesia	2·49
Phosphate of iron	0·20
Alkalies	Traces.
Water and loss	4·72

Enough has been quoted to show that if the decomposition and disintegration of these rocks could be waited for, there is in them abundance of supply for the wants of plants, and that it only requires judicious cultivation to bring out these so far latent elements, existing truly in the soil, but so locked up as to be immediately unavailable to plants.

Now these will all disintegrate by the action of oxygen, of frost and of water; and it is only necessary so to adapt cultivation as to bring them into a state favourable to the reception of the gases of the atmosphere on the one hand, and the locked up elements of the soil on the other.

To cultivate such soils so as to foster and bring out the principles of self-supply – to grow such plants as shall take the least of what is so supplied in the smallest degree, is to carry out as far as possible the *restoration of exhausted land without manure*.

Original cultivation, as primarily adopted in this country, and to a certain extent in Ireland, was simply the taking out of the land from grass—taking off as many crops as it would produce, until, over-run with weeds and perfectly exhausted, it was allowed to lie away and rest until it would again bear a similar process. If we closely examine the formation of a soil we shall find that there are regular successions of vegetation which follow each other from year to year. Take a rock, be it limestone or any other, and we shall find it first covered with the mosses; these by-and-bye decay, and are followed by another species, adhering partly to the stone and partly spreading their roots amongst their decayed predecessors; soon some of the grasses follow; these decay, and another variety succeeds; so that we may observe a sort of natural rotation of crops established in the wide field of nature. The cultivator grows his crops for a particular part—the cereals for their fruit, the sugar-cane for its stem, the potato for its root; but he finds that with all his skill he is quite unable to grow any crop for many years in succession with any degree of profit. Though he may manure the land ever so much, the evident dislike of the crop to those of the same kind is so great, that the land will soon get so foul with quicks and other weeds that it will need a change of crop to admit of their eradication. If we subject any of our cultivated plants to the action of fire for a short time, and then check it, we shall find that the plant is reduced to charcoal—part of its constituents called gases are driven off; and if we continue the burning still further, we shall see that this charcoal will dissipate, and we shall have nothing left but the ash. The ash varies in its proportion to the bulk in certain plants: thus—

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* During the great storm from the south-west in January, 1839, the salt spray from the west coast formed a saline incrustation on the windows at Malton, nearly across the whole island.

100,000 lbs. of wheat contain 2,137 lbs. of ash.
,, potatoes ,, 814 ,,
,, turnips ,, 555 ,,

The parts which are dissipated by fire may generally be understood by the term which chemists call them—the organic parts of the plant; and the ash which remains behind is termed the mineral or inorganic parts of the plant. Of some of the organic portions of the plant, the parts that burn away, it is quite clear we take away from the soil much more than we give it. Many meadows are mown year after year, yielding a ton, more or less, of hay per acre; and though this is not general, yet it is clear it can be done for some years; and thus it is evident we are taking away much more from the soil of some materials than we are carrying to it. Boussingault showed, as regards the carbon of a rotation of potatoes, wheat, clover, turnips, peas with manure, and rye, that the carbon in these crops amounted to 10,705lbs., and in the manure supplied only to 4,267lbs., showing more carbon taken off than was supplied by the manure. It must be evident that some crops, therefore, derive the great bulk of their substance from the air and from water; for Lampadrus found that after a growth of five months of a plant of borage it produced ten times as much carbon as the soil in which it grew had lost.

There are other materials taken up by the plant, called the inorganic or mineral portions; and Professor Johnston has shown that an ordinary four-course rotation will remove from the soil of these—

316 lbs. of potash.
54 lbs. of soda.
192 lbs. of lime.
54 lbs. of magnesia.
14 lbs. of oxides of iron, magnesia, and alumina
116 lbs. of phosphoric acid.
107 lbs. of sulphuric acid.
69 lbs. of chlorine.
365 lbs. of silica.

Now these cannot be in general obtained, except they are in the soil; but there is a wonderful adaptation in plants to substitute one for another of these when one is deficient. Thus, if magnesia be deficient, it can be replaced by the plant taking up an additional quantity of lime.

Now although the soil cannot create any one of these mineral matters, yet by the action of the air, of the frost, of water, the particles of which the soil is composed break down into smaller and more soluble portions; and this is the real value of a fallow, as far as its enriching of the soil is concerned.

Now the object of all rotations is to contrive one crop to follow another, either of which restores matter to the soil, or which deprives it of matter of a different kind, or in a different degree, from its predecessors. Hence, all good farmers hold it to be an axiom in good cultivation, that to keep the land in heart they must crop green and crop grey; or in other words, they must grow a green crop at least for every crop of corn.

Take, for instance, wheat. This is commonly sold off as corn: the grain contains the mineral matters, and also the gaseous matters, the phosphoric acid, the ammonia—in fact, the very constituent parts of guano. This sold off, year after year, is a regular process of robbery and depreciation. If the straw only is returned, and a system of two crops and fallow followed, it is absolutely impossible to prevent a farm becoming barren and poverty-stricken.

If, however, stock be kept, if every alternate crop is consumed by animals upon the land, then there is a certain extent of restoration to the soil. The turnip and the clover derive large portions of their materials from the air and from water; and if feeding stock be grazed upon them, inasmuch as fat is composed only of the elements which are supplied by the air and by water, the real enrichers of the soil are left behind; and hence we find those farmers who feed the greatest quantity of stock have the best crops of corn.

But there is here, perhaps, a further principle involved. If we carry off all the produce of a farm, it must grow poorer, if we bring nothing back. Farmers who keep large quantities of stock, have generally to purchase artificial food at some period of the year, and hence their farms get back what they are selling off in corn.

When the four-course system of turnips, barley, seeds, and wheat was introduced, many parties had the impression that it would go on improving for ever. This, however, is a mistake. Our turnips got different from what they were described to be by those who witnessed their first introduction. Our clovers went off, and baffled all attempts to restore them. And then small turnip crops and small clover crops, we all know, mean also a light produce of wheat and barley.

Dissolved bones seem, however, to remedy the deficiency of the turnips, and poor soils supplied with this manure seemed to have all the power restored to produce the vigorous turnips which we have described as the first cultivated. Hence we may infer, that it was the phosphoric acid which the turnip required for its full development, and which was deficient; and as this was supplied by the vitriolized bones, it had the desired effect.

The clover, however, is not so manageable. No chemist or vegetable physiologist has so far, I may venture to assert, anything like demonstrated what it is that produces the failure of that crop. All we know practically is, that by removing the clover crop from its like for eight years instead of four, we may secure its success, and some ingenuity has been exercised to find a crop which will intervene with proper regard to the fertility of the soil, and the proper regulation of the rotation. It is, however, an interesting question whether the clover takes something from the soil which succeeding crops require, or leave something in the land which operates unfavourably on plants of a similar kind. The latter was a theory very plausibly held for some time, but it seems now to have given way. We well know that tares and beans contain much the same elements as clover, and yet we know a crop of tares or beans will enable the farmer to get in the next course a crop of clover. Although, therefore, the subject may remain a mystery for some time to come, we have a remedy in our own hands; but we find that if we take a crop of tares, either mown green, or allowed to stand for seed on light soils, we not only get the soil very foul, but it is quite unfit to produce a wheat crop after them; and if we grow beans, it is often made use of by scourging farmers to be an excuse for selling off the land as many crops as they can.

There are few persons whose land is so thoroughly clover-sick that it will not grow the white clover and the trefoil, especially if they mix a proper proportion of Italian rye-grass; but as red clover is sometimes needed for the horses, it is desirable to have the power of growing it occasionally in a rotation, and perhaps the best intervening crop that can be used is the bean crop. But as this is not always consumed on the land, and as it is sometimes given not to feeding animals, it becomes the more necessary to compensate for it by drilling the beans in ridges, like turnips, and filling these ridges with manure; when this is done, they are less impoverishing, and may be tolerated. Still, they may become so foul, that even the manure applied is only so much encouragement to that worst of all enemies of light land—the quicks.

It is desirable to sow them in very wide ridges. My impression is, that there should never be less than twenty-one inches between the ridges; and the best beans I ever saw were sown at intervals of twenty-seven inches between the ridges. Some light land farmers actually plough between the ridges; and unless they can, they should be several times hand-hoed and twice or thrice horse-hoed. By this means the soil may be kept clean and in heart, and the wheat crop may be sown after it with some prospect of success. It may be objected that there are few farms where the turnip crop can spare so much manure as is necessary for so liberal a supply to the beans. But the answer to this is, that if it is desirable to get a crop of clover at all, it is desirable to purchase artificial manures for the turnips—apply the farmyard manure to the beans, and thus remove the clover crops further from each other, and keep the land in a high state of cultivation.

So much for sustaining the clover. The question occurs, can we, in very loose, grey, and yellow sand, maintain a wheat crop once in four years successfully? A few years ago, nothing but rye and maslin was ever attempted in such situations. The application of bones, and the consolidation of the soil by sheep treading, however, have enabled the lightest land farmer to grow wheat; still it is questionable if it is the most profitable always to grow wheat on such soils, and the partial trial of oats in such cases is generally a preferable course. It is far from a bad practice to take a wheat crop on such soil one course, and an oat crop the other; and thus the fertility of the soil may be maintained. On a piece of turnip land, where the roots are consumed early, a little wheat may be sown with advantage, and indeed the April wheat now introduced will make this rule apply to as much of the turnip land as the cultivator may wish. A friend of mine, Mr. Thomas Eeles, of Iselbeck, grew a very nice crop of this wheat, which was sown in April and carted in September, just four months on the land—got in good condition, and a very excellent sample: the land had been a moor—was a light blowing grey sand. When wheat is sown after the turnips, barley may be sown on the seeds, and if the objections to spring wheat can be removed, it is a very useful change for one course of the rotation.

Having alluded to the ordinary modification of regular light-land rotations, there is this question, of how a deteriorated soil, or a naturally poor sand, is to be got into condition by a system of cropping? It is sometimes more convenient to restore a farm by a system of cropping than by the direct application of manure. This can be easily accomplished by taking two green crops for one white one, as turnips, oats, and seeds. If these crops are consumed on the land, there need be no fear of getting the poorest soil into first-rate condition.

In Nottinghamshire, and in the north, a five-course system, or allowing the seeds to remain two years, is very common; and this is said to be a very refreshing and consolidating system. Others again say it only encourages the bad grasses for the second year; and the most successful five-course farmers are those who give their stock a large quantity of cake, and this may partly account for its superiority.

If light land be foul as well as poor—and from the fast running of the roots, and the early maturity of the seed of the quicks, it nearly always becomes more or less so at the end of the four years' rotation—it is sometimes both a rapid and successful mode of cleaning and enriching to fallow out of seeds. If this is boned, and a crop of rape or turnips follows, it will be found a thorough mode of securing our object, though many object in toto to an open fallow on such soils under any circumstances.

I shall only allude to some intervening green crops which may be taken between others in the rotation; but they can only be useful where the land is clean and in good condition. In the south of England they obtain stubble turnips with some success; but in this northern climate they are generally out of the question. A crop of rye for spring feed, or on dry and forward land a crop of winter tares, may intervene between the wheat and the turnips, and may be taken off for the horses before the turnips are sown. This can only apply to a part of the farm, and would not answer to any great extent, or when the soil was not clean and in a high state of cultivation, or had applications of manure commensurate with the crop.

Allow me to say a word on clay land rotation in conclusion. And if the soil has deteriorated by the taking away of corn crops, and by the selling off of breeding or poor stock, or the making of cheese, it is quite manifest an opposite course may be adopted. The mineral ingredients may be exhausted, or they may not; if not, then the gradual disintegration of the soil would by-and-bye restore a sufficient quantity of free mineral for the crop. Hence the green crops must bear a large proportion to the grey, and the quantity of feeding stock must bear a large proportion to the breeding stock, and thus bring back to the farm something of which it has been exhausted. Oil cake or linseed, or some artificial food, must be brought from a distance, to restore the lost fertilising matters to the soil.

Fallow, wheat, seeds to lie two years, then fallow and wheat again, will restore the coldest clay soil if previously drained. Mr. Bates, of Kirkleavington, adopts a twelve years' rotation for his strong Cleveland clay; and though the land is drained only by the mole-plough, which was executed thirty years ago, the soil is kept by it in good heart. It must, however, be acknowledged he used large quantities of artificial food, but rather for breeding than for feeding animals. It is 1, fallow; 2, wheat; 3, sheep pasture; 4, do.; 5, fallow or turnips; 6, wheat; 7, red clover; 8, beans; 9, turnips; 10, wheat; 11, beans; 12, oats. Thus in twelve years there are four white crops, three of wheat and one of oats, and eight green crops or fallows; and I apprehend if land, however sterile or exhausted, as Mr. Bates's was when he entered upon it, be so treated for a number of years, it must recover. And I do not see how it is possible to restore a clay soil in any way so readily or so safely as by adopting a green crop system; indeed, it is one of the greatest mistakes possible to think that the most money is made by growing the everlasting crops of corn.

Many farmers object to revive their soils by allowing them to lie in seeds, and sometimes to turnips out of seed leys, on the ground of the comparatively smaller sum realized by a seed than by a corn crop; but if rapid successions of corn crops follow each other on poor or worn-out land, they will soon become unproductive; and if stock are kept properly, they may be a source of more profit than even these light corn crops themselves. From a light corn crop the labour (the horse-keeping being a branch of it), the seed, the manure, and all the et ceteras attending the growth of corn, are reductions so great, that the profit may be less than that of a seed crop. But if the saving, in improved condition of the soil by rape, by turnips, and by seeds, be taken into the account, there can be little doubt that there is more saved than lost by a frequent introduction of these instead of crops of corn. Another great advantage of frequent green crops is that the land is by such plans made more free from weeds; and it must never be forgotten that the weeds on our soils carry off the land the same materials as the crops we cultivate. If we can grow crops which are consumed on the land, which keep it clean, and admit the hand and horse-hoe, which derive a large portion of their elements from the atmosphere, and if we consume our green crops by the feeding stock in a greater proportion than corn, our soils will go on improving, and growing better and better. There is a Flemish proverb which ought to be ever borne in mind by all good cultivators—"No green crops, no stock; no stock, no manure; no manure, no corn."

Sowerby, Thirsk, April 30, 1851.

FARM HIRINGS.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

At no period in the history of agriculture have occurred such grave doubts and difficulties in the hiring of land as at the present time. In former days, it is true, wars have raised the value of the farmer's produce, years of dearth have brought famine prices; but when peace returned, and average seasons came again, the old prices once more ruled in the markets. A widely different state of things now perplexes and injures the English farmer: the prices of free-trade are rendering profitless all his best efforts. He is told that those which now govern the corn market are such as are not likely to be maintained; but where can he find any evidence of this? Both the landlord and the tenant naturally, however, hope for higher markets; and hence, unless the principle of a corn rent be adopted, leases are almost out of the question.

Of late, on many estates, these rents have been calculated not only on the average price of corn, but also on that of beef and mutton. In a recent communication from Mr. T. H. Davis, of Orleton, near Stourport, he remarks—"As agent to many landowners in this part of the kingdom, I have, within the last twelvemonths, relet a great number of estates upon a fluctuating scale of produce rent, according to the following table:—

SCALE OF RENTAL.

	Wheat. Per qr.	Barley. Per qr.	Beef and Mutton. Per stone of 8 lbs.	Rent to be.
	s.	s. d.	d.	£ s. d.
When the price is at or above	40	22 6	42	204 0 0
	44	25 0	44	216 0 0
	48	27 6	46	228 0 0
	52	30 0	48	240 0 0
	56	32 6	50	252 0 0
	60	35 0	52	264 0 0
	64	37 6	54	276 0 0

"One-third of the rent to be calculated in wheat, one-third in barley, and one-third in beef and mutton. The wheat and barley to be taken from the averages that regulate the tithe rent-charge, and the beef and mutton to be taken from the 'Guide to Smithfield Market,' published in the *Farmers' Almanac*. The rents due Candlemas and Lammas in each year to be payable according to the averages of the year ending the first of January preceding.

"Taking £240 as the starting point, and dividing that rent into three parts, for every 4s. per quarter depression in wheat a reduction of £4 will take place in the rent, for every 2s. 6d. per quarter in barley the same reduction, and for every 2d. per stone of 8 lbs. in meat a similar reduction; and in like manner, for every advance of 4s. per quarter above 52s. in wheat, 2s. 6d. above 30s. in barley, and 2d. above 48d. per stone in meat, a corresponding advance of £4 in each third part of the rent will take place."

In a subsequent note, Mr. Davis adds—"In reference to my scale of produce rent, it may be as well to state that, where farms have been in the occupation of the same tenants for the last seven or ten years, I make the rents paid during that period the starting point, opposite to wheat at 52s. per quarter, barley at 30s., and meat at 4s. 8d. per stone. In new lettings I have made the starting point the value of the farm according to the average prices of the last ten or twelve years."

It is only by this mutual resolution of both landlords and tenants to meet the untoward events of the present time in a spirit of fairness, that any chance exists of comfort either to the farmer or the landowner. It is idle to suppose that by settling the rent on any other data than the probable prices of corn to be expected during the lease that satisfaction to either of the contracting parties can be reasonably anticipated. Again let me repeat what on a former occasion I have already remarked, that this would be less doubted on all occasions, if the landlord and the tenant bore steadily in mind the great principle on which all rent is fairly calculated—that it is merely the division of profit made upon a farm, after all the expenses of that farm, including the interest of the tenant's capital, is paid. If this is the true definition of rent (and I can see no other way of more correctly stating the case) the natural conclusion to which it must lead seems evident, viz., that it is as much the interest of the owner as of the tenant to enlarge in every possible way the productiveness of the land. If the contracting parties are once convinced of this, it follows almost as a natural consequence that everything should be avoided that tends to retard the improvement of the farm, by either demands for high rents or covenants restraining good farming, or allowing the continuance of bad—covenants, too, which retard the application of capital to the land, without which few improvements can take place, or profitable returns be expected. The results of following such a course were well yet briefly depicted by Mr. Samuel Jonas, of Cambridgeshire, who, when addressing Mr. Pusey's tenant-right committee, observed, "If I were a landowner I would rather give my tenants sixteen years' leases, renewable at the expiration of twelve years, and also binding myself or the incoming tenant to pay for unexhausted improvements; I would rather do that as a landlord or as a tenant than have tenant-right with yearly tenure, because by so doing you give to the tenant an interest in the property and an interest in the parish, and you give him an interest in improving the moral condition of the people; he has that interest in the people that a yearly tenant would not have. A man fixing himself in a parish would feel as I have felt it my duty and interest to employ all unemployed labourers in that parish. We have not any unemployed labourers there, and I have felt it my interest to improve the moral condition of the people; but that would not have been the case with a yearly tenure; it is therefore necessary to grant leases." (Shaw and Corbet's Digest, p. 130.) The great and almost only difficulty in a lease has hitherto been the amount of the rent which can be fairly calculated upon by the contracting parties. The present period, too, is hardly an exception to the rule; for, although the legislature has at length, by repealing the corn laws, allowed the prices of grain to find their own natural level, yet still in the mere infancy of this freedom, it is, I feel, only the prudent course for each party to await the results of a little experience of seasons and prices before a fixed amount of rent is agreed upon, since these may be too much influenced on the one hand by fears of overwhelming imports, and on the other by low-priced foreign corn, which the skill and the enterprise of the merchant may readily surmount. In such a state of affairs, a corn rent appears to be the only temporary expedient. I say temporary, because I am aware that in Scotland, and in other places where the corn rent system is most prevalent, that even there it is not universally popular.

It was this all-important relation between landlords and tenants that Mr. C. Welton made the subject of a recent pamphlet. This contains the substance of a lecture delivered before the members of the Wickham Market Farmers' Club. He remarks, after speaking of the bad cultivation so commonly engendered for want of proper leases, "The first powerful impression my mind received upon this subject was at Holkham, where, with my father, I paid a visit; I think it was to the last sheep-shearing meeting but one in 1849, and if perfection has ever yet been attained in agriculture I should say it was there. It is no wonder that the Norfolk farmers cherish a remembrance of the virtues and the golden days of Thomas William Coke, Earl of Leicester. Happy to figure in the society of his numerous and highly respectable tenantry—affable, courteous, and liberal, still severe—an improving tenantry was his motto, the secret of his success and of his largely acquired fortune. At the same time, anything approaching to neglect or bad cultivation he disliked as poison: he felt it to be an injury done to the poor man, to the community at large, and to himself. The secret of Mr. Coke's success in possessing an improving tenantry, was the effect of something done on his part. There was a foundation, a cause, upon which this success had its origin and fulfilment; and as no effect was ever yet produced without a corresponding cause, so his brilliant career of more than half a century had its origin, progress, and fulfilment in granting leases for 21 years, with liberal, readable, practical covenants, devoid of those repetitions we sometimes meet with, which the authors of them never understood, and the landlord and tenant never read." As a portion of such leases, should be found covenants allowing of what Mr. Welton alludes to in a subsequent portion of his lecture—"The extinction of useless and unprofitable hedgerow trees, the enlargement of small enclosures, and the substitution of new whitethorn or other fences, in lieu of the present old banks." He placed a just reliance upon the intelligence of the excellent Suffolk farmers he was addressing, when he anticipated little objection on their part to these improvements. "War, I think I may say by common consent," he added, "has been declared against these cumbrous, useless, and unprofitable occupiers of much of our best soils, the very pest of the good farmer, and the nursery of vermin of all kinds, and weeds without end." The late Mr. Arcedeckne, of revered and honoured memory, saw this. By his directions, within the last ten years, many thousands have been cut down upon the Glevering estate. Few persons except the farmer himself can form an idea of the injury sustained from pollard trees, especially where the soil is naturally heavy and wet, and the enclosures small. No greater obstacle presents itself to the present improved system of tile-draining than the roots of trees. Nothing hinders the proper harvesting of the various crops of corn and other produce so much as the exclusion of sun and air by these pests. Let every gentleman, then, desirous of encouraging good cultivation, at least reduce the number of useless pollard trees upon his estate. The size of the enclosure is also a matter requiring inquiry. "I take it," adds Mr. Welton, "in a business point of view, that the object of both landlord and tenant is to make the soil as productive, and at the same time to lessen the cost of production, as much as possible; and I know of no means so effectual for accomplishing this as by making the fields of a more uniform size. None, in my opinion, should be less than ten acres, especially arable land. Smaller enclosures for pastures may be well under some circumstances, and upon the smaller occupations; but upon small arable fields the loss of land, the loss of time, and expense of cultivation, the treading of the headlands, and the additional loss and expense in harvesting, are great drawbacks. I am confident, if the owners of land would covenant with their tenants to raise a stipulated proportion of new fencing every year, as far as practicable in straight lines, and at right angles, squaring the fields to about the proposed size, and removing the old banks—which commonly contain, by-the-bye, not the worst stuff which a farmer carries upon old ploughed land—a vast improvement would be effected in a very few years in the comparative tillable value of much of the property in the country, at a less cost than any other change which, under the name of improvement, can be suggested." That in such improvements the community are deeply interested no one with whom we have to contend will deny; for, as the farmer whose work we have here been quoting asked the intelligent Suffolk farmers by whom he was surrounded, "When we see a farm well stocked and highly cultivated, the labourers all employed, the tradesmen thriving, the waggons loaded home as well as to market, rents, rates, and other outgoings all paid—under such circumstances who suffers? Why, no one. Take another and a similar farm, where things are managed just the reverse; with nothing upon it but a few poverty-stricken cattle, about a moiety of the requisite horse and manual labour—in short, nothing done, nothing doing. I repeat the question, then who suffers? Every one. In every point of view, then, we find it to be to the interest of the farmer, of the landowner, and of the community at large, that the cultivation of the soil should be an advancing and a remunerative profession. It is idle, however, to expect that this can be permanently the case without the hearty, the anxious co-operation of both the landlord and his tenant."

ON THE CULTURE OF CARROTS.

The carrot gets the name from the quality of giving a pleasant relish to the eaters of the plant, and from its having a sweetish taste. It is the *daucus* of botany, and was well known to the Greek writers, but is thought to have been by them confounded with the Cretan spignel, or Candy carrot, which grows abundantly in that island, and of which a species is found on Gog-Magog hills, in Cambridgeshire. The carrot belongs to the class and order *pentandria digynia*, of *Linnæus*, and to the natural order *umbelliferæ*, or *umbellata*.

Generic character.—Umbel, compound; concave when in fruit. Involucre of several pinnatifid leaves. Calyx — superior, obsolete. Corolla—petals five, inversely heart-shaped, inflexed; the outer ones larger and radiant. Stamina—filaments five, capillary, spreading; anthers roundish. Pistillum—germen, inferior, small, elliptical, compressed, rough; styles, two, reflexed; stigmas, blunt. Perianth, none. Fruit—ovate, hispid. Seeds—two, elliptic, oblong. Central flowers of each umbel abortive.

Essential character.—Involucrum pinnatifid; corolla somewhat radiant; fruit muricated; central flowers abortive.

The common carrot is biennial, and flowers from June to August. It grows very common on pastures, heaths, and headlands. The umbel is at first a little convex, but becomes gradually flat, and then, as the flowers are going off, more and more concave, till it forms a perfect basin, in its seeding state resembling a bird's nest. From this circumstance it has received the name of "bird's nest," or "bees' nest." In the wild state, the root of the carrot is hard, slender, fusiform, and whitish or brownish in colour. Stem upright, grooved, hispid, two feet high, with alternate branches, which are long, commonly six or seven to nine or ten inches, have one leaf on them, except the primary or terminating one, which is naked, and have a single umbel of flowers at top; bottom and principal leaves sheathing, tripinnate, the last pinnule-toothed, and terminated by spinules; the nerves hispid; the flowers are white; those in the middle sometimes tinged with purple; these are fertile, but those in the circumference, which are irregular and larger than the others, are frequently either neutral or have pistils only. The fruit is spheroidal, composed of two plano-convex seeds, on the back of which are four membranaceous narrow crests, pectinated with linear, setaceous, innocuous, flexible teeth, and between these, three raised nerves, having very minute prickles on them along each side, bowing outwards; the belly is flat, or slightly concave, marked with obscure longitudinal streaks.

Carrots were introduced into England from Flanders about the year 1600. The seeds have been recommended as a powerful diuretic, and an infusion of them has been found to give relief in fits of the gravel and stone. The roots are good bait for catching moles, and for destroying crickets, when made into a paste with wheat-meal and powdered arsenic, and are also used for poultices, to mitigate the pain and abate the stench of foul and cancerous ulcers. When grated fine, or boiled and mashed to a pulp, and applied without the intervention of lint, the poultice has a truly surprising effect in allaying the intolerable pain and in abating the shocking fetor that attend these dreadful disorders. A very good spirit may be distilled from carrots, and the refuse will be excellent food for fattening swine.

Carrots delight to grow in deep, warm, light loams, with a dry subsoil, composed of materials that are friendly to vegetation, and which possesses no clammy induration of noxious or repulsive ingredients. It is best formed of similar matters with the upper soil, or differing only in the approach to a rocky consistence, and probably to the upper diluvial stratum. Wet lands, or shallow soils of any kind, are useless for the growth of carrots; if other circumstances be favourable, the want of depth must debar the cultivation of the root. The root of the carrot grows altogether below the ground, and differs from beet, which stands mostly above the earth. Consequently the carrot requires a deeper soil for the descent of the tap root, and it demands drier lands, and of a more sandy nature. But light sands are objectionable, as a loamy richness must prevail, though of a lighter nature, and porous in the texture. The climate must be warm and early; yet the carrot bears much cold, and withstands the winter much better than beet. Still the use of the plant is more circumscribed than of beet, which will grow on a greater variety of soils, of which the inferior kinds are unfavourable equally to both plants. The county of Suffolk possesses the best soil for carrots; a loamy sand which lies upon the "crag," or the upper marine formation of the tertiary system, which is formed of clays, sands, and shells, with the concretion devoid of the viscous clamminess that adheres to marine agency, and which ceases as the progress rises to the fresh water alluvium of the sub-aërial deposit. In this understratum the tap root of the carrot finds a congenial element, and, if it does not afford a direct aliment to vegetation, it presents no repulsive action to the contiguity of the roots of the plant. In such similar situations only is the culture of the carrot to be recommended.

The application of dung to the direct growth of carrots never fails to encourage a large growth of lateral fibres, and a profusion of leaves, which very much deteriorate the value of the crop. The land must be naturally good, well cleaned, and kept in good heart by the routine of cropping that is pursued. Farm-yard dung that is rather more than half-rotted must be laid upon the stubbles after harvest, and ploughed into the ground with a deep furrow. In the end of February or beginning of March the land is cross-ploughed and harrowed, and afterwards by the grubber and the harrow, till the proper tilth be produced. The dung and the soil will thus be well mixed, and a rolling will level the land for being sown. The seeds are steeped in water with saltpetre, one pound to six quarts, and encrusted and dried with quicklime when taken from the steep. The sowing machine is provided with long coulters to make ruts in the ground, which receive and cover the seeds at the distance of twelve to eighteen inches between the drills, and 2lbs. to 3lbs. of seed to an acre. A light scarifying horse-hoe is admitted to move the intervals; and when the plants are risen two or three inches high they are thinned by hand to the distance of six inches apart. The horse-hoe is again admitted, and also the hand-hoe, till the weeds are completely destroyed. The plant is not of very quick growth, and the weeding and thinning is done for a longer period of time. Any tall weeds that may arise during summer must be pulled by hand.

Carrots are not easily hurt by early frosts, and the crop is generally taken from the ground in the month of November. The roots are raised from the ground by pronged forks; the tops are cut off by hand-sickle; the extreme tap root and the adhering earth are carefully removed, and the roots are carried to the home-yard, or to piles, where they built and thatched. Sometimes laid among sand or pit dust, and covered with a layer of earth. They are not so liable to fermentation as some other esculents, and also bear frost much better. The tops are much relished by pigs, and in the store yard the consumption of them adds very much to the bulk and quality of the putrescent manure. Cattle and sheep will eat the tops, but do not show any great predilection for them. The roots are fondly devoured by horses, which animals thrive much by eating carrots, and become very sleek in the coat, and glossy in the hair. To cattle the roots are not so agreeable; the animals will eat them, but are not so much benefited by the carrots as are horses and swine. The most profitable use of the roots consists in steaming them for fattening hogs, and mixing them with meals. Raw carrots, cut into slices, are very useful to sheep.

An acre of carrots will yield about 10 or 12 tons in weight of crop, and 264 lbs. of nutritive matter. The white Belgian carrot lately introduced will produce a greater bulk, but probably no more nutrition in relation to that bulk. The carrot is a very nutritious plant, containing 98 parts in 1,000 of soluble matter. They are more nutritive than cabbages in the proportion of 187 to 107½, and superior to Swedish turnips in the ratio of 187 to 110; 64 drachms afforded 187 grains of nutritive matter, 100 grains of which consist of 96 of sugar, 3 of mucilage, and one of extract.

The cultivation of the carrot is very circumscribed, owing to the peculiar soil which is required for its growth, by the nature of the plant and the interference of the climate. With the exception of the parsnip, the carrot is less susceptible of a varied cultivation than any esculent plant yet known; and though the chemical examination of the root shows a large quantity of nutritious matter, yet the practical application does not sustain that high ratio, nor evince that the value is deducible from that application. The presence of the elements does not constitute the nutritive value of plants, nor does the possession of constituents denote the fertility of soils; it is the relative proportion in which they appear, and the way or mode in which they are blended together, that makes the assimilation agreeable to the animal organs, and also to one kind of animals in preference to another.

Carrots are very useful as food for horses, and for swine, either in a raw state, or mashed by being steamed, and mixed with meals. For cattle and sheep the use is not much commended. The produce per acre is comparatively low; the seed is troublesome in being prepared, and the storing causes more labour than turnips. The general application is not so ready as of other green crops, and the results are not so variedly useful. On the peculiar soils of their nature, the culture of carrots prevails rather as a chance crop than a prescribed insertion in the rotation. J. D.

ON POUCHED HEART:

A DISEASE INCIDENT TO CATTLE DURING THE PROCESS OF FATTENING.

"Confestim apparebit."

The subject of this communication is the result of a series of facts noticed for some years past. The observations built upon the facts are sincerely intended to advance the interests of those concerned in the rearing and feeding of cattle: at once showing the impolicy, the inutility, and the injuriousness of the process of fattening, by which the animal is rendered unhealthy as soon as this condition goes beyond the development of its natural standard. The object of this communication is to point out momentous truths, in a direct form, connected with an important disease very common to cattle; and to give in detail the serious consequences which the disease involves: together forming a subject of no mean consideration to the holders and owners of land. Care will be taken to avoid as much as possible what are called "technical terms," in order that most of your readers may comprehend the information intended to be conveyed, rather than to dwell upon such significations, which would be not only excusable, but warranted, if all equally understood them. On the other hand, if there should appear a looseness of phraseology, if expressions should be used which are altogether illegitimate, they are given because they are frequently heard amongst graziers and agriculturists—the expressions are used to signify what these persons intended them to convey.

It is presumed that most are acquainted with the outline of the circulation of the blood; viz., that the *right* side of the heart holds impure blood, where it obtains the material principle from the digested food; that from the right side of the heart the blood is forced up to the lungs, there to be purified, and is afterwards carried to the *left* side of the heart, to be distributed as pure blood over all parts of the carcass. Further, an abstract description of the texture of the lungs, and the process of repiration, is requisite. Moreover, to afford a general summary of the animal economy, the system of the absorbent vessels will be given in a few words. It is hoped by this plan that a frequent and serious disease incident to cattle will be understood, which, whilst the present erroneous process is pursued, is contrary to the graziers' best and fairest interests; in fact, mismanagement in its widest sense and most mischievous form—mere

> " Expensive plans
> For the deluging of dripping pans."

TEXTURE OF THE LUNGS.

A bright, thin, smooth membrane, called the pleura, invests the lungs, and lines also the sides of the chest. A like membrane surrounds the heart, called " the heart bag." The lungs hang by the windpipe, and where the windpipe divides into each lung, the branching part of each side is called the bronchus. The bronchus divides and subdivides until it forms minute hollow twigs; these end in a cell (air cell) which is extremely small, and of which there are great numbers. Black or impure blood is sent from the right side of the heart by the pulmonary artery to the lungs. The exceedingly minute branches of this vessel ramify over the twigs or air tubes into which the air cells open, by which contrivance the contained blood undergoes a change in coming in contact with the air that is inspired, and is so made fit for the purposes of life. The size of these blood vessels is just in a ratio with the natural viscidity of the blood, which, if augmented or diminished, must produce serious disturbance to the passage of the blood. The lungs have their proper nutrient vessels from the general course of the circulation: they are supplied with nerves from the same source or pair as the stomachs and the heart. The spongy texture of the lungs connects the whole with glands, lymphatics, &c. Healthy lungs are of an uniform pink or salmon colour, of a spongy feel, and when squeezed in the hand yield a crackling sensation.

RESPIRATION.

The chest is bounded on the sides by the ribs, below by the brisket, or chest bone; before by the lower part of the neck, and behind by the skirt, which in books of anatomy is called the diaphragm. The skirt is the partition which divides the chest from the belly. The chest contains the heart, the lungs, the large blood vessels which arise from the heart, &c. The belly contains the liver, the paunch, and other stomachs; the melt, the bowels, &c. When the lungs are expanded by the animal's drawing in atmospheric air, the chest is enlarged; the skirt descends, and compresses the contents of the belly. When air is given out from the lungs the reverse takes place: the skirt ascends towards the chest, the moveable ribs descend, and the chest is narrowed. These actions are termed respiration. The air inhaled is oxygen diluted with nitrogen: the expired air is carbonic acid with watery vapour.

To show how the blood obtains the nutritive principle from the food that is eaten, it is necessary to speak of

THE ABSORBENT VESSELS.

As the digested food is passing through the small intestines, in their inside are a number of vessels which terminate in open mouths. These vessels take up the chyle; that is, the nutritive juice of the digested food—a cream-like fluid. After many tortuous windings through the mesentery, they end in a common trunk or duct. This trunk is called the thoracic duct. The vessels leading to it within the carcass are called lacteals. Lymphatics are the same kind of vessels as lacteals. The lymphatics accompany the veins of the other parts of the carcass, and take up a portion of the fluid part of the blood (lymph), which becomes mixed with the chyle. As this mixed fluid approaches nearer and nearer to the heart it approximates to blood itself. All matters that are soluble and absorbed from the intestinal canal are immediately mixed with the venous blood; so the chyle will vary with the matter absorbed. The chemical products of the contents of the intestines are widely different when artificial aliment has been given in lieu of what is natural to an herbivorous animal. Indeed, it is probable that when chyle is compounded of substances unnatural to the animal, the exceptionable portion is directly taken into the mass of circulating blood, instead of being conveyed thither by the course of the thoracic duct. This nutritive principle, thus derived from the digested food, is conveyed by the thoracic duct to the large veins of the fore part of the carcass, just before they end in the right side of the heart.

It is necessary to premise that the heart has four cavities, viz., two auricles (which are commonly called " deaf ears "), one at each side, at the broadest end of the heart. The two ventricles, one on each side, comprise the fleshy part of the organ.

A line may be seen passing down, which marks the situation of the *septum*. This fairly divides the right from the left side of the heart: so that in reality there are two hearts, although it is customary to speak of but one. It is to be borne in mind that the substance of the left ventricle is twice that of the right. *This* has to force the blood through the lungs only; *that* through the whole system. Between each auricle and ventricle there is a valve, which so acts that when the ventricle is filled with blood the communication between the auricle and ventricle is closed or cut off.

In the healthy-shaped heart of cows and oxen there is this variety—the one broader and shorter the other narrower, more tapering, approximating nearer to a cone shape, and incurvated on the left side. It will remain to be investigated how far the original shape of the heart tends more particularly to the production of the disease in question, although it takes place in both, now ventured to be called "the long heart" and "the short heart." Nor is the size or outline of the animal a criterion of the shape of the heart within it, yet is

"A sound heart the life of the flesh." PROV. xiv. 30.

Upon making inquiries at butchers' shops, and being shown a healthy shaped heart, if the history of the animal is known, the reply generally is, "This has had nothing but grass." At another shop you may get as follows: "We always know that an animal with a good heart (of a natural shape) is a heavy weighing one." Again, the cheese-factor remarks, "Although as much cheese is made as heretofore, how uncertain is the uniformity of the quality of the article in the best of dairies! How often is rancidity or sourness produced, owing entirely to the abominable oilcake and other artificial food with which the animals are fed, so as to keep up the quantity of milk, which in quality is always by such a cause deteriorated."

J. A.

(To be continued.)

ON THE ACTION OF LIME IN THE SOIL.

On no point of practical agriculture has the opinion of cultivators been more variously entertained or more discordantly promulgated than on the source of the benefit which land has been seen to receive from the application of pulverized lime that has undergone the process of incineration. In some cases a vast fertility has been observed to follow the use of lime as a fertilizer: in others, no benefit whatever has ensued from the use of a heavy dose of the mineral body; while in a large number of medium cases the benefit has been partial, sometimes of very considerable, and often of small amount, showing effects for one year and then ceasing, and lying dormant for a time and then acting vigorously. To account for these discrepancies, and also to show cause for the effect of lime at any time and under any circumstances, speculation has been rife; opinion has trod upon the heels of opinion and pushed it off the stage; theory has succeeded theory with no other advancement than each to destroy the foregoing—often by no means a difficult matter in speculative matters. Practical men have long supposed that lime neutralises acids and renders them innocuous, kills insects, sweetens sourness, promotes the decomposition of inert matter by entering into combination with the constituents, and facilitates reciprocal unions. These, and similar notions, have long passed for currency, and have not been very much controverted, and never demolished. Of late years, since chymistry upreared its head with the confident assumption of explaining every difficulty, and removing every impediment to agricultural perfection, the subject of lime has come in for a share of investigation; and the use of it as a manure has been treated in a respectable volume by Professor Johnston, of Durham, who has, no doubt, used the utmost powers of science in attempting to explain and improve the action of the mineral earth. But unless the "why" and the "wherefore" be made palpably evident to the farmer, and very easily applicable in his case to the production of the "*quid pro quo*," all speculations and assumptions on such points are visionary and useless, and become of none account.

A very general opinion has ascribed to lime an oceanic origin, as being the earth of fishes or the putrescent residue of marine animals. Some opinions contend for an igneous origin, while not a few reckon it a peculiar formation of the aluminous and silicious earths. It is a substance of all others the most diffused over the earth, and in the composition of animals and vegetables. It abounds in most places of the globe, forming vast ranges of rocks and mountains, as a primitive rock, a transition deposit, and in the flat or secondary formation it occurs in several modifications, ending with the chalk or the most recent deposit, and also in some fresh water formations, that have been collected since the last stratification of earthy substances. The primitive and transition sorts afford the finest statuary marbles, and the hardness resists any impression of igneous action; while the more recent deposits in common, compact limestone and chalk, afford access to the action of fire and other applications.

Common limestone is found to consist in an earthy base that is largely saturated with carbonic acid gas, which holds the stone together, and gives the name of carbonate of lime. The stone is not fusible by the most violent heat of the furnace, and is even infusible before the blowpipe, except by the oxyhydrogen application.

A passing notice is sufficient for the theory of Sir H. Davy, that lime is the oxide of "calcium," a metal of casual occurrence during his experiments, and which agreed, or was made to accord with his favourite views of attributing to every earth a metallic base, from which the former had proceeded by oxidation. Little is known of this metal, which contains in 100 parts from 28 to 38 parts of oxygen. It may remain a creation of the fancy, and never be more pushed into notice.

Lime is mostly found in a state of carbonate, with about 55 parts of earthy base and 45 parts of acid. When pure, it has an acid, pungent, disagreeable, urinous taste, a corrosive quality, and a power of turning vegetable blues into green, and at last, yellow; and these properties impart the alkaline character and distinguishing feature. It is thus an alkaline earth, and forms one link in the chain of connection between the alkalies and the earths. They are dissolved in acids, and not precipitated by the caustic volatile alkali, but very readily by the fixed vegetable alkali, and this property distinguishes it from other earths. Effervescence with an acid is not always a sure test, as it will take place with carbonate of iron and magnesia; but when none happens it shows that no appreciable quantity of lime exists.

The use of lime as a cement has been known from the earliest ages, and the application of it to the land as a fertilizer has also an early date. Hence, the incineration of the stone, by means of a violent fire expelling the fixed air or carbonic acid gas, must have been very early practised; but no certain memorials exist when the practice had originated, or how the process was performed till the records approach the period of the middle of last century.

It was observed, as is yet seen, that the effects of lime, as of all other manures, are in a direct ratio with the quality of the soil itself, or with the quantity and properties they contain of the remains of animals and vegetables, which is called "humus, mould, vegetable soil, cultivable stratum," being the last deposit of the alluvial geology. This stratum affords a variety of materials of various kinds and in different states of decay, and the action of manures is favoured with many points of contact for the development of their energy. Hence the vast superiority of loamy soils over clays and sands, which are formed of fewer ingredients, and these are repulsive to chemical action.

The fixed alkalies are manures from fire, being composed of pure air, and highly inflammable metallic substances, and lime being an alkaline earth or base, or possessing the properties of an alkali, will inherit the original igneous quality, which will be strengthened by the violent heat that is applied to effect the incineration. To the exertion of this heat in producing a warmer temperature in the land, the whole benefit that is derived from the lime must be attributed.

Heat and moisture are the chief elements of vegetation; without the agency of the former no substance can assume the gaseous form. Caloric must be held as one chief spring of chemical affinity. It dilates bodies, separates the particles, diminishes the attraction for each other, and proportionally augments the attraction of the particles of adjacent bodies, and consequently produces combinations and facilitates reciprocal unions. On lands of medium quality as to wetness and dryness, and which are formed in a deep stratum of decomposing exuviæ, the heat of the lime gets a body of materials which very readily imbibe the caloric, and retain it for the stimulating of the vegetable growth of the crops. The remains of animals and vegetables are very easily accessible to the action of heat, as they formerly belonged to organized bodies, and retain the properties they once possessed. The effects of lime are large or small, according to the quantity of the animal and vegetable exuviæ, and will decrease in the exact ratio of the want of these fertilizing constituents, or as the land becomes worse in quality, and can retain less heat to increase the temperature. This tendency will go on till it reaches clays and sands, and then the effects of lime will wholly cease from the almost total want of the exuviæ above mentioned to receive and retain the heat. Hence, composts of lime and earth have ever proved more efficacious than lime itself, because the earth of the compost imbibes the heat and adds it to the land. Clay is repulsive to any but an overpowering action, and the quantity of lime usually applied does not reach within many degrees of that magnitude. Sand is easily heated externally, and as freely gives off the caloric; but it is totally wanting in the humid retention and use of the heat which is performed by the remains of animal and vegetable bodies, from its being inorganic and impervious to functional performance.

Of the above fact, in the case of earthy composts, many convincing proofs have occurred to the writer of this article during a very varied and extensive practice in the art of agriculture. There also happened two very notable instances of the total failure of lime, where the trials were fairly made on half-acre pieces of land, in the middle of extensive fields. One soil was a light loam of gravelly sand, weak in the estimated quality, and very moderately productive. The field was an arid clay that overlies the coal formation, of fair quality in that kind of soil, very wet and thin in the staple. The lime, in the quantity of 200 bushels on an acre, was applied in August on a bare fallow, and covered by a harrowing. The space of ground was thinly covered with farmyard dung, as the rest of the field. The lime was laid on the other field in April, just before the land was ploughed for barley, after a crop of turnips, and covered by a shallow ploughing, in the same quantity of 200 bushels to an acre. In neither case did the lime show the very smallest difference in any following crop of the rotation. On the sandy land, the lime did not find any body or bodies in the quantity sufficient to imbibe and make use of the caloric which it conveyed to the soil: and on the clay fallow, the heat of the lime was completely repelled, and rendered of none avail by the overpowering qualities of the aluminous formation. These reasons can be applied in all similar cases.

On the same farm lime was applied in the same quantity on a soil of heavy, deep, black loam, where it acted most vigorously, as it got a large quantity of decomposed earthy matters, which imbibed the heat and husbanded it for use. Very heavy crops followed the application, and the effects did not cease during the period of two cycles of the rotation.

In the case of land that is pared and burned into ashes for the purpose of imparting fertility, it is quite certain that the benefit conferred on the land arises from the higher temperature that is imparted to the soil by the heat of the conflagrations. Ashes have been carried and laid on land that was pared, but on which no ashes were burned, and the benefit was comparatively nothing. Any small benefit would arise from the caloric which was conveyed in the ashes, but not sufficiently intense to penetrate the ground. Be this as it may, the fact is very certain, from many attestations, besides trials made by the writer for the purpose of testing the former accuracy.

I do not know how far my ideas on the action of lime may be sanctioned or disproved by chemistry, but I have ever given, and am yet inclined to give, much more credit to an enlightened and varied practice than to the vagaries of a science, which, however correct and beneficial in its own sphere, seems wholly lost when transported to agriculture. The philosophy of the one is not the philosophy of the other; and every art is promoted by its own reflective observations. The quantities of lime yet applied are wholly inefficacious on clay lands, or soils of any strength. J. D.

12*th May*, 1851.

A FEW WORDS ON HATCHING AND REARING POULTRY.

[We extract the following from the *Cottage Gardener*, a most valuable publication.]

In submitting the following brief hints on hatching and rearing poultry, the writer has endeavoured, by adopting plain an simple terms, divested of all technicalities, to render himself perfectly intelligible to the merest novice in *poultry culture*. Having had many years' experience in the above, the information may be relied upon; and in the first place, I would recommend all parties desirous of procuring a superior breed of birds, at the least possible expense, to obtain two or three barn-door hens about to sit, then buy from some neighbour, having the desired breed, fresh-laid eggs, allowing from eleven to thirteen to each hen, according to size; should more than thirteen eggs be placed under a hen, and the weather prove cold, the chances are that one-third of the clutch, at least, are spoiled.

If an out-house or cellar can be used for the nest-house, so much the better, provided the floor is slightly moist. In the darkest corner place a good handful of broken oat-straw; and to better form a nest, and prevent the eggs rolling out when the hen moves, place a row of bricks all round. In such a place the chickens will shell out strong and healthy. Many persons may wonder at my recommending a moist place; but let it be remembered, if you leave a hen to herself, she will choose for the brooding-place a spot under a bed of nettles, a gap in a hedge, inside a stack of faggots, or similar damp places; all being places nature has pointed out as the most suitable, and apparently for this reason: the germ of the egg floats uppermost within and against the shell, in order that it may meet the genial warmth of the breast of the fowl. We must, therefore, in hatching, apply most warmth to that part only; the egg being supplied with only a limited quantity of moisture, is thus arranged to prevent evaporation from a large surface, as the egg is only very warm at the part in contact with the fowl, until the blood-vessels, searching nourishment for the embryo, have surrounded the inner surface of the shell, when the whole egg becomes gradually warm, and eventually of an equal temperature. I will reserve the remainder for another early paper.

LONDON FARMER'S CLUB.

THE BEST MEANS (LEGISLATIVE OR OTHERWISE) OF INDUCING CAPITAL TO BE MORE FREELY INVESTED IN LAND, AND THE BENEFITS WHICH WOULD RESULT THEREFROM TO ALL CLASSES.

The usual monthly meeting of the Club took place at the Club-rooms, Blackfriars, on Monday, May 5, Mr. W. Shaw, of the Strand, in the chair. Subject—"The best means (legislative or otherwise) of inducing capital to be more freely invested in land, and the benefits which would result therefrom to all classes."

The **Chairman** said: In the absence of our Vice-Chairman, and not having a regular chairman of discussions appointed, I have been asked to take the chair, which I do very willingly, as I am at all times happy to do what I can to promote the objects and success of the Club. The subject of discussion for to-night is most important—I am sure that there could not be a more interesting one, under the present circumstances, than that which is now about to be submitted to you—"The best means (legislative or otherwise) of inducing capital to be more freely invested in land, and the benefits which would result therefrom to all classes." I shall not anticipate any observations that will be made on the question, but simply content myself with saying, that I feel an entire conviction that at the present moment, more than at any other period in the history of British agriculture, it is a subject which involves the most important considerations.

Mr. **Edmund Tattersall**, Jun., then rose and said: Having proposed the subject for to-night's discussion, viz., "On the best means (legislative or otherwise) of inducing capital to be more freely invested in land, and the benefits which would result therefrom to all classes,"—that subject having been selected by the Committee, I now, in accordance with their decision, and with your permission, will attempt to bring it comprehensively before you; for it is one that ought to be regarded in no narrow point of view, affecting as it does, for good or evil, the destinies of millions of our fellow-countrymen. I have somewhere read that the middle of almost every century has been remarkable for some important events affecting the destinies of men. It may or may not have been so. It may amuse the learned in history to search whether such a theory has any general foundation in fact; but it is my purpose to deal with the present century; and the facts of the last few years, and even of the last few days, go far to prove the theory a true one. One thing is quite clear: within the last few years the landed interest has experienced a silent revolution! But let us look back a little, and see how other interests have fared. Scarcely three years are passed by since we thought the daily journals hardly so interesting as usual unless they gave us the details of some new revolution, a capital town besieged, the overthrow of a dynasty, or the flight of a monarch. Such were then the events of every-day occurrence, and not the mere working of a diseased imagination. Scarcely a year before that time and the excitement was more painful, because the disasters were nearer home, and of a nature more keenly to arouse our sensibilities than foreign revolutions, for at that time we were undergoing all the horrors of a "monetary panic," and men of colossal fortunes, and houses in the city whose fame was European, and up to that time looked upon as safe as the Bank, knew that their fortunes were trembling in the balance, and that they could do nothing to avert a calamity that might at any moment overtake them—shatter their fortunes—humble them to the dust—and send the merchant prince of to-day forth upon the world to-morrow an outcast and a beggar! And this was the fate of many a man, ruined beyond redemption when he had no business to be so, in order that the sovereign supremacy of gold should by Act of Parliament enact the bitterest satire upon the folly of men who had spent their lives in worshipping the very god, which now, like the car of the idol of Juggernaut, crushed beneath its wheels the fortunes of many a miserable devotee. But all that is past and gone, and almost forgotten; the ruined are blotted out from the memories of the more fortunate, except when in turning over the pages of the ledger a flash of indignation passes over the brow of the creditor as he looks at the large amount standing on the wrong side of the account of one who, in the polite phraseology of the men on 'Change, became a "lame duck" in that eventful year of disgrace, 1847—the most terrible year ever known in the annals of British commerce. Some people would almost think the events of that year a revolution, but they would thereby prove themselves profoundly ignorant of the laws which govern our monetary circulation; for those who best understand them kindly inform us that we must expect such things to happen at least once in seven years, and think ourselves particularly fortunate if the crisis does not come round more frequently—a high encomium on a state of things which is continually held up to our benighted vision as the very acme of the perfection of human wisdom. Thus the commercial world has gone through the fiery ordeal. The manufacturers had previously had their turn; and now the landed interest, their best customers, are suffering under a state of things which to them is admitted to be ruinous beyond all former precedent; and I confess I cannot see any immediate chance of a change from the dark to the bright side of the picture; therefore I do not see, *under existing circumstances*, any inducement for a larger amount of capital to be embarked in the land; and the reason is that capital embarked in the cultivation of the soil of England *now* does not pay—as a general rule. Such being the admitted state of things, I can come to no other conclusion than this, that free trade in corn and provisions must lead to free trade in land and free trade in money. Free trade in land will soon become an absolute necessity; free trade in corn will bring that result about, and an "English Encumbered Estates Bill" will soon be as necessary as the same legislation has made it a necessity in Ireland. Free trade in money will be a more difficult affair to bring about, but it must be carried at any sacrifice (within constitutional bounds), or the present producing classes of every denomination will be crushed beneath the withering influence of the present system, until there will be but two classes left—the very rich and the very poor; the gulf between the two is rapidly widening; and while true wisdom, taking its lesson from the history of the past, points with threatening finger to the dangers, let us take her warning in time, and not be guilty of that worst of follies, the bitter experience which arrives too late. I have long seen that, next to free trade in corn and provisions, the origin of the evils under which the agricultural and the industrial classes suffer, lies deep-seated, and hid from the casual observer, under the specious mask and many mysteries of the present system of our monetary laws. I was strengthened in this opinion during the debate on the inequalities of taxation, and how far taxation entered into the farmer's produce, when in January last Mr. Baker proved that much of the debt incurred at the rate of 102 bushels or quarters of corn, would now have to be paid off at the rate of 388; or, to make it still plainer, that every £102 of debt incurred at one time during the war, would now cost £388 to pay it off, and that we are consequently paying interest on £388 instead of £102. The monied interest are therefore reaping a pretty good harvest; and then have the impudence to taunt the farmer with wanting Protection! I unhesitatingly affirm, that the monied interest is protected to such an enormous amount, as to have become an enormous monopoly; and yet that, in spite of all this, it does not stand upon a secure foundation! The monied have also quietly saddled the landed interest with all the heaviest burdens of the state. Well might Lord John call the farmers the "clods of the valley;" but I think he will find the "clods" begin to think that they have been crushed nearly long enough! But the same cause has operated almost as fatally at times upon the manufacturers; and their turn will come again in its regular rotation, unless the two interests, meeting in that friendly spirit which once was the characteristic of Englishmen when the battle was over, agree to shake hands, and become friends and confederates, as I hope one day to see them, and, feeling that their interests are identical, unite against their common foe—capital, based on a restricted currency, which, like Aaron's rod, swallows up the profits of all the producing classes, and contributes comparatively nothing towards supporting the burdens of the state! In the total repeal of the present monetary laws, or their thorough revision, rests one of the most effectual cures for the losses of the agricultural interest, and of every interest into whose productions labour enters as a component part. No small measures—none of the cheeseparing common-places in which Hume's pedling soul delights, or Cobden's revolutionary thoughts rejoice, will be of any avail at the present moment of intense danger to the best interests of the nation. The future Chancellor of the Exchequer, who with a determined hand shall remodel the monetary and currency laws, and reversing their present fatal action, shall enlarge the fertilizing stream in proportion to our growing wants, will bring back happiness to many a sinking man—will comfort the afflicted, and save the working and the labouring classes from ruin! The man who shall have the courage to dare this, and the ability to perform it, will earn for himself a name in English history of which the greatest benefactors of their species might be proud. He will be assailed by all the virulence and animosity of the organs of the monied interest, and their partizans of every kind. He must be callous to abuse—he must be contented to be branded as an idiot and a fool—probably a rogue! But it will console him to remember that he has on his side justice and benevolence, and wide-spreading charity; that he is fighting the battle of the man who labours in every department of life, against the most terrible of tyrannies—the monopoly of capital, with a currency improperly restricted. The combatants are Capital and Labour: they are old antagonists, and I hope their struggle will end in peace and good-will; but there is no denying the fact that, end how it may, the struggle is near at hand! The present state of things has this tendency—to make everything cheaper except money. It has brought wheat down from 56s. to 40s., and will very probably bring it lower. The landed interest are suffering in consequence. What does common sense dictate? To bring down the price of money in a similar proportion. We hear a great deal of nonsense talked about the natural price of corn! The natural price of corn must vary in different countries, according to the expenses of production, including taxation; but it is insisted that the English grower shall sell at the "world's price." He sells it at that price! In return he has a right to demand money at its natural, and not at its artificial monopoly price! I look upon this as the second-best chance of saving the agricultural interest; and not only that interest, but every other producing interest in the state; and I am glad that such is the case, as I would not argue this question as the question of one class; and fortunately the country is beginning to discover that the majority in numbers, and the majority in wealth, the majority in respectability and the majority in intellect, have come to the conclusion that their interests are identical, and that those interests are suffering! This appears to me the only remedy against the devastating curse of *cheapness*, springing from an overdose of foreign corn, which is depressing the landlord, ruining the farmer, and pauperizing every person dependent on the landed interest, including the great majority of those in trade, and which must in turn react upon the manufacturers themselves. And it will have another effect: it will render disloyal the most loyal part of the inhabitants of England! Our rulers ought to bear in mind one great truth—that the national character depends upon just legislation. The present laws are doing all that laws can do to demoralize and denationalize England! Can anything be more absurd than the action of our monetary laws, which, when free trade in corn is taking large sums of gold out of the country, contracts the circulation of bank-notes as the gold decreases, at the very time when it ought (for the benefit of the nation, though not of the monied men) to be increased! We saw the result in 1847 in an almost national bankruptcy, when Lord John was obliged to rush to the rescue of the Old Lady in Threadneedle-street, when in her last gasp he saved her from ruin with his 8 per cent. recipe; stopping the action of the law, but just in time to avert a national bankruptcy! Was not that a sufficient warning? But I think I hear some horror-stricken man of gold exclaim, "Upon what, then, will you base the currency?" My answer will be, Not upon so slippery a foundation as the gold in our hands—as that has already proved, and must again and again, under similar circumstances (which are more than ever now likely to occur) prove but a sandy foundation! As long as England remains as she now is, by her industry, her commerce, and her agriculture the richest nation under the sun, she has always the wherewithal to buy gold as her occasions require. Why not give to our countrymen of every denomination, by an increased paper currency, based upon the wealth and credit of the country (which no one disputes), the means of doubling the products by which gold can be bought? Then it will be asked, "But how is this to be done, and where is the limit to be?" I think I can show you how it can be done, to the salvation of the landed interest, the benefit of the country, and the safety of the state. I would suggest that the Chancellor of the Exchequer, at the commencement of every session, should do what other men of business do, preparatory to beginning a new year, viz.—make up the accounts of the last, take stock, and make his calculations for the future; and when he has done this (and he is not worthy of his position or his pay if he cannot do it), then let him lay his statement before Parliament, calculating the amount of currency requisite to carry on the business of the country for the next twelve months. And let this be the first business done; let it have precedence of everything else; and when this is settled, Parliament will have conferred a greater boon upon the people than it has of late years. It will not be a difficult point to decide; and they who passed railway bills to the amount of £363,000,000 cannot say either that they doubt the amount of the capital of the country, or are afraid or incompetent to decide on such a subject; although it is one, simple as it seems, which affects the fortunes of every man and every class, for good or evil. This once settled, the mercantile, the manufacturing, the agricultural, and the monied interests, will all start fair, and know how to base their operations; and the going out for a time, to return when required, of a few millions of gold, more or less, will not frighten the whole island from its propriety, or make the merchant in the city dependent for his very fortune on a good or bad harvest, which ought really to have as much effect on his fortunes as the changes of the moon; but which, by the present means, may cause a panic, contract the currency, and ruin him. The effect of this would be to raise the prices of all the products of labour, and decrease the value of money, which is what we want, and the only thing that can save us under the reign of free trade. We shall then be able, *mirabile dictu*, to pay our taxes with pleasure, dispense with the income-tax, pay our public servants well, keep up our fleets and armies at their proper state of efficiency, pay our labourers good wages, and should no longer be pestered with the idiotic ravings about retrenchment and economy of the maudlin peace lunatics, who, like wolves in sheep's clothing—some of them—go about the country preaching peace, in language which sounds uncommonly like sedition. Capital is now heaped up in too large masses; like inland lakes without proper outlets, which, in times of sudden rain, often overflow their banks, and carry ruin and desolation into the valleys below, which are in like manner parched in seasons of drought: I would dispense it by a thousand streams, in a course of irrigation which should fertilize both hill-side, plain, and valley. It is not impossible—it is not even difficult, provided we get a legislature that is intent on benefiting the country it assumes to govern, more than on its own party tactics. Having now shown how the currency may be made our friend in need, I will next proceed to show how capital can be tempted to invest itself in land, and the consequent benefits. It would take up too much time for a discussion of this nature to inquire into the causes which have led to the difficulties which hedge round the land of the country to the man of small capital wishing to invest his money in land—the best, the safest, and to the nation the most useful and productive of all investments. These difficulties may have arisen from laws founded on wisdom at the time of their adoption; but we live in days of progress, and the land must go, and now perhaps may go advantageously with the stream. These difficulties—great to the man wanting to invest £100,000, infinitely greater to the man investing his £1,000, because entailing heavier expenses in proportion, in investigating title; and the thousand-and-one technicalities thrown around the preparations to a clear, good, and marketable conveyance become almost a prohibition to the man who would put his £100 into land. Why is this? *Cui bono?* To no mortal men except the lawyers; and perhaps not so great a benefit to them as they imagine, as under an improved system they would have an immense increase of conveyancing business. It is natural to man to wish for land—to be an owner of land; it is a passion which has been wisely implanted within him; it is an impulse which at the same time gratifies his desires and ties him to become a good citizen, by giving him an interest in the safety and well-being of his country; it gives him a stake; he has something to lose; and the democrat becomes conservative. This is but in accordance with the immutable laws which govern human actions; it is human nature—one of the things which our rulers have thought fit to neglect in their calculations and in framing their laws, and which political economists seldom deign to notice; and this neglect has been the fruitful source of many a cancerous wound in the body politic. The tendency of our legislation has been to accumulate the capital embarked in land, as well as in trade, into comparatively few hands; and the number is rapidly decreasing, in such a ratio as to be instructive on the subject, if studied. The laws of entail, and the power of tying up to trusts and uses, and many other legal technicalities, may, under a certain state of things, have been beneficial; but, under free trade, these very laws are acting against all parties, and against no class more than the proprietors, who are taxed with mortgages, family, and other fixed payments, leaving some of them a clear margin of 50 per cent., some of 25 per cent., and many less. But I will take one of these two sums for the sake of elucidation, and many examples of both propositions can be found. And I will prefer taking a man of moderate income—not one of our immense proprietors, as they do not feel the pinch so severely (although many of them are proprietors only in name); but I will prefer taking the English country gentleman, living upon his own estate, and having a rental from land, of a fair average quality, of 4,000 acres, let at £4,000, clear of tithes (paid by the tenant), making the rent to them, or rent

and rent-charge 25s. per acre, or	£5000
Mr. John Bull then has nominally	4000
But he has mortgages and family payments amounting to (no uncommon case)	2000
His average income then has been............	£2000

and this he has been in the habit of spending among those around him, in the usual style of liberality characteristic of the English country gentleman—doing good to all his neighbours, charitable to the poor of the parish, and generally respected as a magistrate and a neighbour. But the Legislature enacts, very much against his wishes, free trade in corn, telling him it will not hurt him, and that he knows nothing of the matter; that his rents will not decrease, because Mr. Cobden says so; and Mr. Cobden is the farmers' friend, because he is a farmer's son. This is about all the reason given to Mr. Bull; and, although he believes it gammon, rather than rebel like a Radical or a Leaguer, he—good easy man—consents, more particularly as he is held up as a vampyre and a bloodsucking monopolist; and his natural high spirit forbids him, in delicacy to himself, to advocate a cause which might appear selfish, although he knows that in advocating it he is upholding the interests of his tenants, the clergyman, and the labourers of his parish, who look up to him and the parson as their best friends in time of need. Free trade is carried. Within four years, his tenant's capital is reduced one-fourth. Their profit is gone; and Mr. Bull, "like a fine old English gentleman," at his last audit-day, reduces his rents 25 per cent., having previously reduced them 10, 15, 20 in the preceding three years, upon the principle of "doing as he would be done by"—an old-fashioned idea which, thank God! is not quite gone out of fashion in the country, although in London and the manufacturing towns it is called, in the slang of the day, "an exploded fallacy," superseded by the pet doctrine of the political economists—to "buy in the cheapest and sell in the dearest market." And has our "national cry" descended to this—the costermongers' creed! But to return to Mr. Bull:

His income of	£4,000
Reduced one-fourth, now yields him only	3,000
The interest of mortgages and annual payments is the same	2,000
Leaving Mr. Bull's net income only..........	£1,000
Instead of, as it used to be.................	£2,000

This is no uncommon case. And on whom falls the loss? On the poor of the parish, on the extra servants employed, on the small tradesmen, and on the national income. The probability is that Mr. Bull, under these adverse circumstances, breaks up, from necessity, his establishment, forsakes the land of his fathers, becomes a useless, degraded, broken-hearted man, and will finally take refuge in that "refuge for the destitute," an "English Encumbered Estates Bill," for to that complexion we must come at last, and we are almost arrived there. It is a terrible conclusion; but, like Sterne's captive in the dungeon, the English landowner is bound down by chains, partly of his own making, perhaps, but not the less deeply on that account does the iron enter into his soul; and so, in like manner, into the soul of his tenant—at present, to even a greater degree; and soon will the curse descend to the labouring population, who are at the present time employed by the farmers at a loss—a fact for which I honour them, knowing it to be true, and a fact that will soon speak trumpet-tongued; for, however unwilling not to employ the labourers, this must soon be the result of the present state of things. This may be benefiting the country; but I think, like Cobden's prophecies, it ought to be construed by the rule of contrary. And now, out of all this present evil, how to find a future good! This confiscation of landed property must entail an encumbered estates bill. All persons really conversant with the matter know it. Disguise the fact as you can, this must be the result, in plain English; and thus I prove that free trade in corn must lead to free trade in land; and when this point is arrived at, I see a hope and a chance, if it is not thrown away, of a better state of things as regards the title to landed estates, a great many of which must pass through this new state of purgatory; and, in doing so, let it be arranged that every chance shall be given to the poor culprits of being released, *in transitu*, from some of their sins and many burdens. The title of every such estate must be thoroughly sifted, and a Government title guaranteed. From that time, with regard to all these estates (and their name will be Legion), let a well-digested scheme of registration commence. Let the form and the cost of conveying land be simplified, so that plain men can understand the forms required and know the cost. Let the expense be decreased, and reduced to a certainty; and let it be enacted that from henceforth no mortgage or fixed charge shall be valid upon any such estate unless formally registered. If the difficulty be urged, this difficulty has been already overcome in many of the countries on the continent of Europe, and I would exemplify its working by pointing to Prussia, where, under such a state of things, the "pauper" belongs to a genus almost or quite extinct.

Would that Ireland could say likewise! Mark, I would not make this compulsory except to the estates which pass through the Court from necessity, but I would leave it open to any to make use of its provisions who chose to do so. This would in no way interfere with the rights of unencumbered estates; would confer a boon on the encumbered, and a benefit to the community, by assuring an easier channel for the introduction of capital into the purchase of land. There are few small tradesmen in towns or villages who would not like to invest from £100 to £500 of their savings in land, if it could be invested as easily in land as in the funds. People like to see something for their money, and the Englishman has a high respect for the "dirty acres" when he can procure them. Give him the opportunity, and you will turn many a discontented demagogue into a sober thinking man, who will feel that his interest is identical with the land he lives in. It is the best and safest means of bringing to a friendly issue the unnatural war of classes. Let us then for a moment draw a comparison between our friend, Mr. Bull, with his £4,000 a year, now, as shown, reduced to £3,000, and our friend Smith, making his £4,000 per annum in his office in the city "on 'Change." Far be it from me to say one word against Smith, as Smith; but when at the end of the year Smith finds that in the honest exercise of his vocation he has gained £4,000, which Jones finds upon a similar inquiry that he has lost, this may be very satisfactory to Smith, anything but pleasant to Jones; but whether Smith wins, and Jones loses, or the reverse, is of not the slightest consequence to the nation, as neither of them is a producer or creator of wealth, but simply the means by which it passes from hand to hand. I do not include in this category the merchant-princes of England, almost the noblest class which our country can boast. It is a very different affair as regards their income or that of Mr. Bull, because their loss is a national loss, as their income arises from the beneficial employment of capital and labour, and this point ought never to be lost sight of, for it is all-important in its different results to the country. National wealth has only one source; that source is labour beneficially and profitably employed in any way, but the land is the best and safest of all the sources in which it can be employed; and if the stream of our wealth under a better system of currency, and a better system of laws relating to the titles and management of the landed interest, were but directed by a master-hand, then in a few years we should not know the meaning of that disgraceful word—a pauper or surplus population! Whether the means that I have suggested are, in the opinion of this meeting, the best adapted to obtain the end in view will shortly appear; but if they are—or if not—if a better means to the same end should be pointed out and clearly demonstrated, then there is another point I wish to impress on the landlords, the tenants, the labourers, and all whose interests are bound up and affected with theirs, and that point is this: that whatever the remedy, its application rests in their own hands. The time is near at hand when, if they have the courage and determination to exert themselves, they may do so effectually; and if they neglect to do so, they must make up their minds that the once-neglected opportunity will not recur again in time to save them. The experience of the last few years has taught this lesson to all who are not wilfully blind, that no statesman in the present day can originate much. The pressure from without is the first and real motive-power. The manufacturers understood the squeezable nature of the materials they had to deal with, Let the landed interest take a hint from their adversaries, and handle brighter and more honourable weapons, with equal skill and equal determination to win, and the battle may be their own. Fresh champions are daily appearing in the field, in aid of their cause. They can boast a name in itself a host—that of Sir E. L. Bulwer Lytton—lately a volunteer in their service, and one whose opinions, clearly, calmly, and manfully expressed, must carry great weight, coming from one of the highest intellects which the age can boast, and that opinion volunteered against the party with whom he would otherwise prefer to act. Ought that cause to be considered a weak one which numbers among its champions the three best living writers and clearest thinkers of the day—Alison, Disraeli, and Bulwer? In my own mind, I am quite convinced that whatever course things may take, the currency question is the most powerful weapon which the agricultural party can use—one which they have strangely neglected, and one which may be made a lever, with which, based on public opinion, and founded in justice, they may, if they employ their forces with judgment, effect a mighty change, not only to the benefit of their own individual interests, but to the satisfaction of every class who, being producers as well as consumers, employ their labour in the creation of national wealth, which is nothing but the realization of national labour. If it should be objected that the plans suggested are great changes, I would ask—Do we not live in times of great changes? Could any such change as is proposed injure Ireland? that country of desolation and starvation, caused by unjust laws. Alas! no change can injure her! But like causes produce like effects; and take warning, that unless some great change is made here, many of the same scenes which we read of with horror, and can hardly bring ourselves to believe true, may come to be enacted in what then it will be mockery to call "Happy England!" And now, sir, it may be asked, why I have not talked of farming, and endeavoured to show how farming, under present circumstances, can be made profitable? Simply because I do not believe that under the existing state of things farming can pay. Let the disciples of the "new light school" prove that it does so, and they will have effected then what they have hitherto attempted in vain! But where is the mighty Mechi? that redoubtable champion; and where, oh where are his accounts? and where the balance-sheet? Echo, I fear, can only answer—Where? Sir, my belief is this; that farming, as a rule, does not pay in England—except, perhaps, at Tiptree; and I sometimes imagine Tiptree and Utopia must be synonymous terms! and our friend Mechi only a myth! And this being my belief, and a belief founded on stern facts, I must leave in the hands of that great professor and the other "learned pundits" who expound similar doctrines, to teach the British farmer how to farm—*to a profit*—under free trade and a fettered currency! Under a brighter prospect, I would have seconded the views so admirably put forward by Messrs. Shaw and Corbet, who have proved tenant-right to be the labourer's boon and the landlord's friend; but those who have not listened to their conclusive evidence would scarcely pay attention to me. There are some few other points, as affecting the farmer, that I might have mentioned; but I look upon these as matters of detail of such minor importance, in comparison to the magnitude of the subject, that I shall pass them by, leaving them to abler champions. As I have treated this subject more as affecting the investment of capital in the purchase of land than in its occupation, it may be asked whether I think that the price of land in England is likely to fall? and my answer will be in general terms, temporarily but not permanently, and not at all in the case of the best description of soils, or those estates which offer inducements, beyond a mere investment, to the man of fortune; and I expect to see them rise in value. But there is a large quantity of land, the inferior soils, which must become of less value as an investment, and still more so, because many estates of this nature must soon be thrown upon the market to be sold peremptorily, and consequently at a sacrifice; and as a land-agent, who knows what must come, I would rather have to purchase for an employer during the next two or three years than to sell, for I am certain that it will be a time for the capitalist to make good investments, and make his harvest upon the necessities of the poorer part of the owners of land, many of whom will be compelled to sell at a great sacrifice. And then, when a time of prosperity once more returns to the landed interest, I hope to see a larger amount of the accumulated capital of the country under happier circumstances, flowing into the easier and safer channels which shall have been prepared for it by the knocking down of the obsolete barriers which now obstruct its beneficial course; and then I hope to see that new era of improvement in agriculture commence, of which we hear so much, but which the events of the last few years have done so much to retard. Then, under happier auspices, I hope to see the landlords (as a body) improving their estates—and there are very few that cannot be materially improved in many respects; then I shall hope to see the farmer, under the stimulating effect of a fair return for his money and time, employing his capital as freely as he ever has done, and ever will do when fairly dealt with; and the agricultural labourer throughout the kingdom better employed, better fed, better housed, and better taught. But these hopes will not be realized until the returning wisdom of the nation discovers that the land is the safest investment, and the most fruitful source of the national wealth. Happy will it be for England when such a day arrives; for I speak as a practical man when I say that England can produce corn enough for her own consumption, that her farmers will prove this when they feel a returning confidence that they will reap the honest reward of their labours in feeding the people; and in fostering this branch of our national industry and national wealth a larger field will be re-opened for the beneficial employment of the poor than by any other means. When this question is properly understood (and suffering often teaches wisdom—and we are suffering now), then I believe it will be found that there is not a man too many in the English dominions, and we shall no longer drive to emigrate 300,000 British subjects per annum, the bone and muscle of the country; most of whom go to add to the wealth by carrying their labour (the source of wealth) to the United States, who gladly receives them, and where Irishmen immediately become good workmen. Unless this subject is soon properly understood a national poor-rate appears inevitable; the land can no longer support the poor when the farmers cannot employ them to a profit, and then the fundholders perhaps will begin to see, fear, and cry "Peccavi!" And now, in conclusion, having pointed out the best means (in my opinion) of inducing capital to be more freely invested in land, and having only slightly touched on the benefits which would result from such a course in diminishing pauperism—the worst and most dangerous result of our system as it exists—I will not occupy your time further; but will sit down, hoping that the discussion may be worthy of the Farmers' Club, may be suggestive of good, may show that farmers and those connected with them can look a little into the cause of things, and show they understand some of "the reasons why" their affairs are growing from bad to worse, and are doing their best to discover the cure for the present evils and the source of future benefits—not to their own interests alone, but to all the best interests of the State. If I should have been the means of leading towards so desirable a point, I hope to have proved myself a not unworthy member of a class—of which, in spite of all that has been said against them lately, by people who ought to have known better, I am not ashamed to belong; for, like Cobden (who was at one time more proud of the name than the farmers are of him), I, too, am an English farmer's son.

Mr. Mechi said: Our friend Mr. Tattersall has read us a paper which I expected to be "On the best means (legislative or otherwise) of inducing capital to be more freely invested in land, and the benefits which would result therefrom to all classes." I should be deceiving myself if I did not state that I feel considerably disappointed, that we were first treated with a discussion on currency and capital, mixed with some political matter, which I do not at all consider as affecting the practical part of this question (Hear, hear). Gentlemen, you may write and talk for ever, before you will be agreed as to what capital and currency will be. Everything that has any value is capital, whether it be a song from Jenny Lind, a razor from Mechi, or a loaf from our friend Baker—everything that has a value is capital, and the parent of capital is industry; and I am prepared to say, that as long as industry and intelligence are the characteristics of old England, so long will she be abundant in capital, as she is at this moment. I do not quarrel with my friend opposite (Mr. Tattersall) whether you are to give perishable notes, or hard gold, or labour; it is quite clear, however, that it is of no use giving paper notes, unless there is something behind to fulfil your promise (Hear, hear). I confess that, unless I had not been in an unhappy mood, I should have felt very melancholy after the speech we have heard from our friend. I see nothing in his speech but the ruin of all the estates in this kingdom—the transfer of them, and the making our land a second Ireland. If I believed my friend Tattersall, I should see ruin staring us in the face. But I do not believe my friend Tattersall; I do not go with him in his lachrymose and melancholy reflections (Hear, hear). I believe there is a strong conviction growing up in the minds of British agriculturists—landlords as well as tenants—that they must grapple with the difficulties of the day, and that, doing that, they will entirely overcome them (Hear, hear). In spite of what Mr. Tattersall has said, I maintain that more money is expended in agricultural improvements now than was expended under protection. I will not enter into the question of protection, but I must say that the surplus-capital of trade and commerce is gradually finding its way to agriculture. That is really what you want; and if I understand, what you wish to get at in this discussion is this: What is the effect of employing a greater capital in agriculture? (Hear, hear.)

Mr. **Tattersall**: What will be the effect?

Mr. **Mechi**: I can only say that from the moment you begin to spend money in putting up steam-engines, draining land, throwing down old fences, and removing worthless pollards—from that moment you begin to employ more labourers, and to create a new class of customers for the food which you produce; from that moment you diminish mortality and crime. It is an established axiom of political economists that crime increases with the increase of poverty; and, taking the increase of the population, you see as the result of diminished poverty a diminution of all those evils which poverty naturally produces. My friend Mr. Tattersall has referred rather pungently to Tiptree Hall Farm. That farm is under trial, under examination; and by its results it will be judged (Hear, hear). On the 31st of October next many an anxious mind will have an opportunity of proving its conclusions from the facts of the case, unbiassed by any opinions of the individual by whom the farm is occupied. I am loath to speak of myself, but I must just say that to me the results of my improvements have hitherto been satisfactory. They have at least resulted in an increased rental—a rental paid by men whose character is too well known for their judgment to be called in question. But, gentlemen, do I say that the improvements made on that farm have been properly and judiciously made? I must say that, from my want of a practical knowledge of agriculture at the time when I undertook them, I believe those improvements were not so economically effected as they could have been by men who had all their lives devoted their attention to the practice of agriculture (Hear, hear). Gentlemen, I admit that if some of my investments have not been so profitable as they might have been, it was not the fault of the system, but of the individual. But is that to be made an argument against agricultural progression? Can such an argument be used when the duty has been taken off bricks, so that you can build so much cheaper than you could, and when, owing to the facilities for conveyance by railway, you can get lime, and other articles of a similar kind, at one-fourth of the cost at a former period? I confess that I entertain good hopes for agriculture. The result of non-improvement must, I believe, be ruin. The only men who will escape ruin as agriculturists are those who progress. The successful men, the money-making men, the men who, let them grumble as they will, we still see in the same occupation, and who exhibit a rubicund countenance though they profess to be miserable in mind, are the improvers—these are the men who will brave the storm; and those who will come to ruin are the unfortunate individuals who will not improve. I was speaking a short time ago to a highly respectable man in Norfolk, a man of large capital made in agriculture. What did he say? "I shall be the last to go." What did he mean by that? Why that the first to go would be the non-improvers; and depend upon it that will be the case. The first to go will be the non-improvers, who will leave others to reap the benefit of the good times, which even our friend Mr. Tattersall is quite convinced will come at last. The question for discussion, stated on this card, is "On the best means (legislative or otherwise) of inducing capital to be more freely invested in land, and the benefits which would result therefrom to all classes." The best means of legislation or otherwise are very simple. I agree with Mr. Tattersall that the transfer of land cannot be made too simple. I see no reason why £10,000 worth of land should not be transferred as easily as £10,000 in the Three per Cents. If we had a government office and a registry, I see not why the only form should not be to this effect: "I, A. B., do hereby transfer to you, C. D., so much land belonging to me, in consideration of a certain sum," specifying the amount. Why should not land be cut into slices, and sold to all the letters of the alphabet, the registry being referred to, as evidence of the title, instead of an old parchment, kept in a trunk, where it is either buried or lost? That is what we want, as a commencement of further agricultural improvement. All our mortgages, and other arrangements, should be made on personal considerations, independently of the original tenure; and there should be nothing to embarrass the free transfer of land in connection with responsibilities, which are of an individual, and not of a national, character. Then, again, with regard to the tenant's security for his investments in the land: I do maintain, that until you induce the landlord to consider the question as a matter of business, and to fall into a system of letting his land much in the same way as men let houses and other property, that question cannot be placed in a satisfactory position. I blame the renters of land; I blame farmers with capital, who take land without an agreement that they shall be able either to remove or to obtain compensation for what they invest in the soil, and what is fairly their own (Hear, hear). The agricultural interest of this country are at present not aware of their powers. The present prices of corn will make them aware of them. Men of capital will say to a landlord, "I am willing to take your land on lease; but I must take it subject to certain conditions: if I put up sheds, I must either be allowed to take them down, or must receive compensation; if I place certain things in the soil, there must be a fair valuation of them before I am called upon to give up possession of the farm" (Hear, hear). Let this be done, and the necessity for legislative enactments will be obviated by private agreements. Let me advise you to depend upon yourselves. As agriculturists, if you are men of capital, you have the requisite power in your own hands. I say this guardedly, and not from any class considerations. Let agriculturists awake from their slumbers, and act on independent principles, as manufacturers do. If you improve, let it be on the basis of an agreement that the improvements shall be yours, and not be left for the benefit of some person who shall succeed you (Hear, hear). I have intruded too long on your time, but the question is one in which I feel very deeply. I could not avoid saying a few words; for, having invested some of my money in the cultivation of the soil, the expenditure which I have thus made has afforded me more happiness than I can describe (Hear, hear). I do believe that one effect of expending capital, supposing the expenditure to be judicious, will be to benefit ultimately both the individual and all classes of her Majesty's subjects. Agriculture must, in a degree, be subject to the same rules as affect trade and commerce. There will not always be sunshine; we must now and then have a cloudy day: but, depend upon it, the producers of food will, on the whole, benefit by that which is beneficial to other classes of the community. I am convinced that the same principles which have tended to reduce price and increase consumption will apply to agriculture. You will produce more at a cheaper rate; but you will not necessarily be in a worse condition, and the community will be in a better, than formerly.

Mr. **Baker** said—Although I may be one of those whom Mr. Mechi designates the bygone, while he would represent himself, I suppose, as belonging to the good times to come, I still have a position to maintain amongst the agricultural classes of this country, and that position I shall endeavour to maintain in spite of any observations which may be made either by him or by any other person on this question. Now, I have always held, and still hold, the axiom in regard to production, that the price of the article when produced must correspond with the amount expended on the production. That is the immediate question for discussion, as I gather the subject from the card. I have always understood, so far as I have learned anything, that cultivation is of all things the most prescient, always following that course by which it will tend to accumulation, and not that by which it will tend to depreciation (Hear, hear); and in trade and manufactures capital always has a similar tendency, and never continues long in a course in which it is likely to evaporate in loss (Hear, hear). The evidence of our senses of late years has been such, that no advocacy of mine can be required to bring this principle home to your minds. Whenever a speculative project has been devised in this country, whether it were the railway mania or the South Sea project, by which it was hoped that capital would accumulate at a faster rate than it possibly could do in fair and legitimate trading, money has gone in that direction; and having done so, a great deal of it has, from various causes, been swamped. But in this case we have a system which has been pursued from the commencement of the world to the present time, which has been carried out to the utmost possible extent, and which has been the means of supporting the largest amount of the population of this country. This system has conduced not only to the support of those engaged in it, but to the welfare of the whole community. On the agricultural wealth of the country the prosperity of England was founded; and England would never have arrived at the point of prosperity which she has attained, had she not based all her efforts upon the agricultural interest. I consider, therefore, that in dealing with this question as I am going to do, I shall be advocating that on which the very existence and the stability of this country depend at the present moment. Mr. Mechi has taken a very different view of this question from that which was expressed by Mr. Tattersall. I agree with Mr. Mechi that Mr. Tattersall's proposition, admirable as it is in many respects, did not immediately touch the question. (Hear, hear.) The question is, how capital may be applied beneficially to the land at the present moment, so as to ensure the greatest return. I have stated before in this room, and that very recently, that capital, as applied to agriculture, exactly resembles a mechanical power applied to any particular purpose. A certain amount of power will raise a certain quantity of water a certain height, but as you increase the height you must increase the power in proportion; and the last foot that you raise the water requires a larger power than the first. In like manner, the first quarter of wheat costs less to produce than the last quarter. I will put a simple case. You shall take land, and cultivate it on the old system—that is, on the system by which the farm, as it were, maintains itself; there shall be no extraneous aids in the cultivation, no feeding on oil-cake, no manure except what the farm daily produces, in order to reproduce the crops which are taken from the land. That was, I need scarcely tell you, the old system of farming in this country. The farmer went on obtaining sufficient manure to produce his green crop; the manure from that was sufficient to produce his barley crop; the feeding off of his clover crop was sufficient to manure his wheat crop: thus he went on from year to year without any extraneous assistance. The question is, whether you can improve on that system with present prices; whether you can now advantageously apply extraneous aids to produce a larger amount of corn than you could obtain from the same area upon the old system? We will suppose that a farmer is cultivating land on the four-course system. On that system he grows, we will say, 3½ quarters of wheat per acre, 4½ quarters of barley, 2 tons of clover, and 3 quarters of peas and beans; and that in the case of the fallow crop there is sufficient manure to fodder out the straw. For that return he bears a certain expense; and I will admit for a moment that the expense meets the return—("Hear, hear," from Mr. Mechi)—it has yet to be shown that by the application of capital to that land, by the assistance of a power over and above that which the farm produces in itself, he can secure a beneficial result. Can he, by employing one-fourth more capital, make the farm profitably produce one-fourth more (Hear, hear)? That question may be answered by another. Will the money which he applies in the first instance—with the cheapest mode of cultivating the land, producing an average of 3½ qrs. of wheat per acre—secure a profit? If the cultivation will not pay when conducted on the most economical principle, how is it possible for it to pay when there has been an additional advance? (Hear, hear). I have looked at this matter in its various bearings, and I am quite clear upon it. It is impossible to bring home a question of this kind to the minds of the public, and of the farming class especially, unless you render your data clear and definite. I know that farmers generally do not take up this question distinctively as it affects each acre of land; they only treat it as a whole. Some farms are partly grass and partly arable; some are more grass than arable, and *vice versâ*, and of course that which applies to one farm as regards expense will not apply to another. But we are now met to discuss the question of the application of capital to arable land, so as to enable it profitably to produce a larger amount than it would produce otherwise. I have by the most minute calculations ascertained that the labour of horses on arable land is just about equivalent to 20s. per acre. I have taken the cost of the keep of horses throughout the summer and the winter—I have calculated the depreciation of each horse from his year's work, and the result at which I have arrived is, that on an average every horse costs 20s. per acre.

Mr. MECHI: That is quite correct.

Mr. BAKER: I have calculated also that the manual labour will amount to from 28s. to 32s. per acre, according to circumstances.

Mr. MECHI: Rather more.

Mr. BAKER: In this case, however, I assume that 30s. an acre is the minimum cost of labour, supposing the land to be in a proper state for cultivation at starting. I am speaking now of the mixed land which prevails in the county in which I reside, and with such land we have arrived, on these two items, at an expense of 50s. per acre (Hear, hear.) I have minutely calculated the charges under the head of bills. In Essex every tenant is obliged to keep the premises in tenantable repair. I have put 1s. per acre for that item.

Mr. MECHI: That is quite low enough.

Mr. BAKER: I then take the smith's bill, the wheelwright's bill, the harness maker's bill, the insurance bill, the veterinary surgeon's bills, the thatcher's bill, and other little adjuncts, which altogether amount to 5s. per acre.

Mr. MECHI: All that?

Mr. BAKER: I would not willingly overrate the case; I have calculated the seed corn, supposing the land to be drained on the four-course system; I have calculated the wheat, the barley, the cloverseed, the peas and beans, and adopting Mr. Mechi's estimate of 6 or 7 qrs. of wheat per acre, 12 of barley, 16 or 17 of oats and so on, I have arrived at exactly 7s. 6d. per acre.

Mr. MECHI: That is very near.

Mr. BAKER: I vouch for the accuracy of all these calculations; I throw them down for any free-trader, however rabid he may be, to pick up and canvass; I now come to another branch of the question. The farm to which I am particularly alluding pays a rent of 25s. per acre. It is an average farm of the county. Instead of 25s. I ought to say 27s. for rent, because on every farm there are a large number of fences, roads, hedges, and so on, for which quite 10 per cent. must be allowed in calculating rent. I assume the poor rate, county rate, and so on, to amount to 7s. 6d. These sums will amount together to £1 18s. If you take £2 10s. for labour, 5s. for repairs, 7s. 6d. for bills of various kinds, and £1 18s., you arrive at the sum of £5 0s. 6d. To that I may fairly add £8 per acre as the ordinary investment in the land: £10 used to be the amount; but we have, I think, reduced it to £8. I allow five per cent. for money, and no man can say that money, as ordinarily invested, will not produce that return (Hear, hear). I take five cent. for the tenant's skill; I take, for the deterioration of farming stock, £4—two and a half per cent. These sums, added together, amount to eleven and a quarter per cent., or 18s. per acre, which would bring up the amount to £5 18s. 6d. Now, gentlemen, these are sums which have been arrived at by careful investigation, and I challenge any one to show that I am wrong.

Mr. MECHI.—On the old system of farming.

Mr. BAKER.—On the regular and general system of farming in the present day. I now come to the produce. I have spoken of the expense of feeding the horses. On every farm there is a certain feeding value in the straw. The straw belongs to the landlord, and the tenant has no power of converting it, except by applying it to the land, and either leaving it there for the benefit of the landlord, or using it to his own profit. But there is a feeding value in the straw; and in Essex we are accustomed to consider that value as covering the cost of thrashing and carrying out the corn. I believe it approximates to that as nearly as possible. The thrashing and carrying out would amount to 12s. per acre. The average feeding value of the straw on the four-course system is 8s. per acre, and I give credit for the straw as going to the feeding of the horses and the cattle. I assume that four quarters of wheat per acre—I call this an assumption; for I confess that with all the ability that I can exercise, with all the exertions that I can make, I cannot realize four quarters of wheat per acre on the land in my occupation for a series of years (Hear, hear); I do it in some years, but in others the quantity falls off to a considerable extent; I can find no farmer in the district whose experience, in this respect, differs from my own.

Mr. MECHI.—Mr. Wm. Hutley.

Mr. BAKER.—Mr. Hutley cultivates a different description of land from mine, and if he is an exception on one side, you (addressing Mr. Mechi) are an exception on the other (laughter). I assume, however, that four quarters of wheat per acre are actually produced, and that the price realized is 40s. per qr., realizing a total of £8. I assume five quarters per acre of barley are grown.

Mr. Mechi.—A good average.

Mr. Baker.—As regards the question of a comparison between oats and barley, every one knows that where barley can be grown, it will afford a much better profit than oats (Hear, hear). Five quarters of barley will, I assume, realize £6. Clover is the next shift in the course. I assume that three quarters of peas or beans—which is, I think, above the average in my district, or throughout England—would realize £3 15s. Supposing clover to be half fed off, and half mown, and assuming a production of 2 tons per acre, at £2 10s. per ton, we arrive at the same result. For the purpose in view it does not matter which way we take it. I come now to the fallow crop, and this is, I confess, very difficult to deal with (Hear, hear, from Mr. Mechi). I have assumed, however, that in the case of the fallow crop, the green crop is taken off the ground. I have taken the feeding value of the green crop for the whole extent. You must be quite aware that where only one part of the farm is taken, a large quantity of manure must be requisite to produce a large crop, unless you introduce extraneous aids. Assuming the cultivation to be conducted on the old system, and without additional manure, I have taken the crop for the whole extent of the fallow land at 50s. per acre. I dont think any gentleman who is a farmer will quarrel with that estimate, not even Mr. Mechi (laughter). Last year a gentleman on my right opened a very admirable discussion in this room, on the cost of producing and the feeding value of an acre of turnips. I believe he made the cost to be something like ten or eleven pounds, and the feeding value to be a much less sum. He observed that it was an axiom in Norfolk that the value of a ton of turnips was equivalent to a stone of beef, but not to a stone of mutton. He then went on to state that, notwithstanding that axiom, he believed that if the matter were perfectly averaged, the feeding value of a stone of turnips was 5s., and if the value of a stone of meat was 3s. 6d., this also would be 3s. 6d. He had, however, the candour to admit that it was 5s. If you take 50s., and divide it into so many fives, it will produce 10 tons of turnips or maugold wurtzel, or any other description of food, and that is as much as you can expect to have without using any extraneous materials. I have therefore taken 50s. as the value of the turnip crop.

Mr. Mechi: A very fair average.

Mr. Baker.—Now, gentlemen, if you take 8s. as the feeding value of the straw, £8 as the value of the wheat, £6 as the value of the barley, £3 15s. as the value of the green crop, £2 10s. as the value of the turnips, and divide that by four, for the four years in which these several crops were produced, you will get £5 3s. 8d. per annum as the gross receipt from an acre of land. If you look on the other side, you will find that the cost of production, charging only 5 per cent. for the interest of money and the skill of the tenant, is £5 18s. 6d.; consequently there is a difference of about 15s. between the cost of production and what is realized by the articles produced. Such is the legitimate result from data, of the accuracy of which I am thoroughly satisfied (Hear, hear). You may tell me that farms which are well cultivated will produce more than 4 qrs. of wheat, 5 qrs. of barley, and 3 qrs. of peas and beans. I tell you it is a good return—it is, in fact, a better return than the majority of farmers obtain, notwithstanding all that we hear about high farming. I wish to know, too, how by adding to the cost of production you can make the profit so much larger as to correspond with the increased cost; and unless you can show that, I must maintain that I have established my argument that the application of increased capital in agriculture resembles the application of increased mechanical power. Mr. Mechi admitted this evening that he entered upon the farming business without much practical experience, and with a good deal of speculation; he confessed that if he had to commence again, with his present knowledge, he should proceed in a rather different manner. I am glad that we have heard that admission. Now, in reference to production, I have another authority, and one with which Mr. Mechi is conversant. There is a newspaper in this kingdom which is regarded as the organ of Messrs. Mechi, Wilkin, and Davis, and is entitled "The Agricultural Gazette." These gentlemen, I believe, all write in it; and it is considered to represent free trade. The editor of that paper, Mr. Morton, gave a very interesting statement as to the value of turnips as applicable to the production of meat. I wrote to Mr. Morton for explanation, and in the reply which he sent to me he said he had never thought that free trade would benefit the farmer, but only that it would benefit the community at large (Hear, hear). I believe the farm, to which the statement that appeared had reference, was the Whitfield model farm. From the statement made it appeared that the payments in the four years beginning with 1845 and ending with 1848 amounted to £6,147 2s. 9d., and the receipts in the same period to £6,828 2s. 2d., showing a profit of £680 19s. 5d. in the four years (Hear, hear). The statement was followed up by some observations of the editor; but £680 was the whole return for from 4,000 to 5,000 tons of Swede turnips. I asked Mr. Mechi what a ton of turnips was worth, and he said 2s. 6d. Now, gentlemen, with these facts before you, I say you cannot dispute my proposition. I have here a statement of the produce of a highly-cultivated farm. In this case, I add half as much more to the investment. Instead of making it £8, I make it £12. I make the calculation in the same way as before. I increase the manual labour from 50s. to £3; I let the repairs stand as before; I increase the rent to £2. I give credit for wheat, 4½ qrs. per acre; barley, 5½. I also take the value of the turnips for feeding, and the whole amounts to £5 per acre. I adopt Mr. Mechi's principle. Mr. Mechi says he has half his land in wheat.

Mr. Mechi: There are the potatoes.

Mr. Baker: I confess that the more green crop—the more turnips you have, the greater is the profit; but still, having made a loss of 18s. on the other system, I make a loss of 12s. on this. As regards potatoes, I have entered into some calculations, and I think 300 bushels per acre is the utmost quantity that can be produced: the value of that quantity is generally only £15; the lowest expense of producing it is £10; therefore there will only be £5 left; and the question is, not what is produced, but what profit is obtained (Hear, hear). Mr. Mechi has informed us that when he was in Norfolk a producer in that county said to him, "I shall be the last to go." He might be the last, but still he did not deny that he would go (Hear, hear, and laughter). The language addressed to farmers often reminds me of a man in Campbell's "Pleasures of Hope," whom the poet describes as seeing hills before him, which, as he approaches them, always recede, so that he can never reach them (laughter). "Hope deferred maketh the heart sick," and those words aptly describe the present condition of the farmers. It is my firm conviction, that unless something be speedily done, the agriculture of this country will be irretrievably ruined. A gentleman who has lately visited America, Mr. Johnston, states that throughout the whole of North America the producers say that even they cannot cultivate profitably at present prices; the cultivation is carried on with a view not to profit, but to the subsistence of the population. Let it be remembered that the labouring classes in Poland, Russia, and Transylvania, are fed on rye, and not on wheat at 40s. a qr.; and that 2s. 6d. for labour there is equal to from 7s. to 9s. here. There is nothing against them but the expense of transit. I admit that we have good roads and good markets, whereas they have bad roads and bad markets; but the expense of transit is not equivalent to the difference between the cost of production there and here. They can come into our market at an advantage to them of 25 per cent. Again I ask, then, whether it is advisable to invest more money in the land when the result of cultivation, conducted on the most economical principle, is what I have shown.

Mr. **Lawrence** said, that in consequence of Mr. Baker's allusion to himself, he begged to say that he never made the value per ton 5s.; but having seen calculations of from 10s. to 15s., and even 20s., he hardly ventured to state so low a sum as his own experience would have led him to do. In stating 5s. he went much beyond his own convictions.

Mr. **Acton** congratulated Mr. Tattersall on having brought forward this question, which was one of very great importance to agriculturists. Having had something to do with the legal relations of landlord and tenant, he must say that a great alteration must take place in the law before capital would be largely invested in land. As the matter stood at present, owing to the burdens which had been imposed upon it for the last two centuries, the land in this country always obtained a very artificial value, the whole, or at least the greater part, of the existing burdens seemed to have been placed upon land because it was visible and tangible; whereas, personal property, money, and stock in trade, was neither visible nor tangible, and had, in consequence, been made to bear a very unfair proportion of the public burdens (Hear, hear). A conveyancer, Mr. Brady, had attempted to prove that that was not the case; but he thought he had quite failed in the attempt. It was well known that formerly the owners of land were under an obligation to fight for their country; and the defence of the nation was carried on entirely by means of money arising from land.

Mr. **Mechi** dissented from this statement.

Mr. **Lawrence** believed that such was the fact. He would not, however, stay to argue the point, but rather turn to the immediate question, which was thus stated on the card—"On the best means (legislative or otherwise) of inducing capital to be more freely invested in land, and the benefits which would result therefrom to all classes." The law affecting the relations of landlords and tenants had of late attracted a good deal of attention; and the interest taken in the matter had increased, in consequence of the publication of a work on the subject by Mr. Wingrove Cook. The alterations to be made in leases must be in a great degree founded on the statements in Mr. Cook's excellent work; and he hoped the aid of legislation also would be called in to establish what was termed tenant-right, which was necessary to place the tenant farmers of the country in a satisfactory position. The question of tenant-right had been so often and so ably discussed in that room, that he would not be justified in then dilating upon it; but, speaking generally, he must say that, until there was more co-operation and sympathy between landlord and tenant, until more liberal covenants were framed, and more enlightened views were acted upon, it would be impossible, at least with present prices, for the farmer to carry on the cultivation of the land at a profit. On that subject he entirely concurred with Mr. Baker. If the obstacles were removed, capital would be employed much more freely, and a much larger amount be invested in land. Mr. Tattersall had truly observed that farming was a very favourite occupation, not with occupying farmers alone, but with gentlemen of large means. He hoped that legislation, or other effectual means, would speedily be adopted to promote the interests of agriculture, and to enable capital to be invested more freely in land than it could prudently be at the present time.

Mr. **Sidney** hoped he should be excused if his observations on this subject were not entirely complimentary. He did not think any discussion could be of the least use if truth were not spoken plainly though politely (Hear, hear). He certainly could not compliment the gentleman who had opened the question on the tone of his address. However they might agree with some of Mr. Tattersall's opinions, he for one could not go along with him in numerous assumptions contained in the paper which he had read—assumptions not supported by a shadow of argument. Mr. Tattersall had contrived to introduce two or three questions which in his opinion had little, if anything, to do with the real question placed on the card for discussion. He (Mr. Sidney) had the disadvantage—for in some respects it no doubt was one—of not having been accustomed to take part in the discussions of the club; but there was at least one advantage in that circumstance, namely, that it enabled the club to see what was the impression produced on the mind of a comparative stranger by what took place in that room: it afforded members, in some degree, an opportunity of judging as to the opinions and views of those who had not been running, as it were, in the same groove as themselves. When he saw the question on the card, he thought they were about to have something practical in reference to the employment of capital on land; he did not expect to hear a discussion on free trade, and still less could he have imagined that they would enter on that occasion into the question of the currency (Hear, hear). He wished to enter his protest against one or two sentiments uttered that evening, which appeared to him to be in their tendency subversive of the rights of property and of all social progress, and which, if everywhere carried out fully, would bring this and every other country into a state of utter confusion. In the first place Mr. Tattersall laid it down as an opinion not to be gainsayed that for a long series of years there had been a growing gulf between the poor man and the rich man. He (Mr. Sidney) did not think they had much to do with this matter that evening; but he regretted to hear such an assertion, and thought it should not have been made without some evidence being adduced in its support, since nearly all the evidence on this subject with which he was acquainted lay decidedly in the opposite direction (Hear, hear). If they would only examine what was the position of a working man in this country a hundred years ago, and compare it with the position of a working man in the present day—of course, he spoke of the general condition of the poor—they would thus be enabled to arrive at something like accurate notions on the subject (Hear, hear). The next point which he would notice was the alleged obligation resting on the Chancellor of the Exchequer, not only to determine at the commencement of every session how much money was required for the public service, and with how little the affairs of the country could be efficiently managed, but also to secure good wages and full employment for every one (laughter). He did not know what they had to do with such a question any more than the Chancellor of the Exchequer himself; but certain it was that that public officer had not of late years done very much to induce them to place confidence in him, or to call upon him to settle these abstract questions. Why, what was proposed was, in fact, Louis Blanc's celebrated proposition, namely, that the State should undertake to provide for every class of the community, instead of everything of that kind being left to the individual exertions of every patriotic and industrious person in the state ("Hear, hear," from Mr. Mechi). He (Mr. Sidney) maintained that every movement was in the wrong direction which tended to induce them to rely on the State instead of themselves. What was the cause of the difference between the condition of England and of America, and the condition of France and some other countries? In England and America every man conducted his own business, and depended on his own exertions; whereas in France, and some other parts of the world, there were too many persons calling on Jupiter to help them out of the mud, when they ought to be setting their shoulders to the wheel and trying to get out themselves (Hear, hear). He should not have said one word in that discussion had it turned entirely on the point introduced by Mr. Baker; but it happened that on this question he possessed some slight knowledge, and he wished to treat the question in the manner in which it presented itself to the mind of a practical occupier. He must say that he thought they had been running the red herring when the fox was before them. There could be no doubt that nearly the whole body of tenant farmers of this country were at the present time in a lamentable state of distress; he had a large acquaintance with that class of persons, having been introduced amongst them throughout England for the last twelve months. But it did not follow that because farmers were sick and could not at once become well, they should not apply themselves in the best manner they could to the seeking relief, and do all that lay in their power to improve their condition. He would, for example, begin with the question of land tenures or the titles by which land in this country was held. There could be no dispute that titles were now in a most unsatisfactory state. That had been asserted and admitted again and again. This matter had been made the subject of a very admirable report, which ought to be in the hands of every English farmer, written by Mr. Stewart. Mr. Stewart had shown clearly that land might be rendered as readily transferable as any other kind of property, even tables and chairs. This work was not that of an Utopian, but that of a lawyer, a conveyancer of high reputation, and well fitted to deal with such a subject. Now this was a most important point, and had a practical bearing on the interests of agriculture. Great men now possessed large estates of which they knew nothing, and the titles were of such a nature as to prevent them from feeling that interest in their property which they otherwise would do. It had often happened that farmers had laid out money on land and reaped no benefit from the outlay. He might refer especially to the case of the late Lord Egremont's estate. Lord Egremont granted a large number of leases to his tenants; those leases had now been upset, and the occupiers had, he believed, lost all that they spent in making improvements (Hear, hear). He could not go along with Mr. Tattersall as regarded the case of the gentleman who, having had an estate which realized £2,000 a-year, died broken-hearted because he had the misfortune to be reduced to an income of £1,000; but the desire to become a freeholder was a very natural desire, and some alteration should be made in the law with the view of placing all parties concerned in a more secure and satisfactory position, so far, at least, as their position could be affected by titles. Attempts had indeed been made to improve the law in that respect, but he regretted to say that they had not received due support from the agricultural interest (Hear, hear). In 1831 or 1832 a bill was introduced in Parliament for the express purpose of amending the law on which the titles of land rested: it was opposed by the entire body of lawyers throughout the country, and the agricultural interest were almost entirely silent. Mr. Tattersall had referred to the question of farm leases. He (Mr. Sidney) had a good deal to do with printing, and the other day he happened to be in a printing establishment in which were printed forms of leases on a large estate, these being sent to the printer by the lawyer of a great nobleman in this country. Now, he must say, that it was one of the greatest misfortunes of the tenant-farmers that in such matters, instead of having to deal with a gentleman who was practically acquainted with the subject, they were almost invariably referred to a lawyer who knew nothing about it (Hear, hear). He regretted the frequent introduction in that room of the question of protection and free trade. This was likely, in his opinion, to prejudice their cause, and to be regarded as a justification of the imputation as to the narrow ideas of farmers. One thing connected with that point struck him as particularly comical. Whenever agriculturists met, they were sure always to refer especially to Mr. Mechi. They began with Mr. Mechi and they ended with Mr. Mechi, as if Mr. Mechi was the only leading idea in their minds (Hear, hear). No doubt it was extremely aggravating to those who were pursuing farming as a business to see a gentleman who was engaged in trade as well as agriculture laying out his money as an amusement, but he thought such frequent allusions to the gentleman in question were to be deprecated. It seemed to afford good amusement to some persons to draw the badger every time they met with him (laughter).

Mr. **Lawrence** said though it might not be in accordance with the feelings of some gentlemen present, he must express his own belief that a reversal of the legislation of the last six years, and the revival of the protection of native industry, would be the most likely means of securing an end which all had in view.

Mr. **Tattersall** replied: He said he was very happy to hear the different opinions that had been given, and was not at all sorry that gentlemen had differed from his views. But as he held that the object of discussion was to arrive at the truth, it did not matter what a man thought so long as he expressed his opinion fairly and decidedly, and he hoped the truth would be arrived at whether he were right or wrong (Hear). He was very glad to hear Mr. Mechi come to the conclusion (for it was not often that he did come to any conclusion), that when he commenced as an agriculturist, he commenced as many other men do—with no vast amount of knowledge on the subject; and that might account perhaps for many of the discrepancies that had been seen in that gentleman's career, he frequently asserting things as new which, though new to him, were decidedly known to many practical agriculturists. He (Mr. Tattersall) was not much surprised at this. It was easily to be accounted for, because Mr. Mechi's career as a farmer did not commence very long since, while he (Mr. Tattersall), though a younger man, was a practical farmer, had been longer acquainted with the practical details of farming, and was therefore an older agriculturist than Mr. Mechi. He took the liberty of saying to Mr. Mechi at Christmas, in the presence of Messrs. Hudson and Smith, of Devonshire, that a man ought not to put that forward as an agricultural experiment which had not been tried more than once, and had not stood the test of two or three seasons. He thought it was for want of keeping this in mind that Mr. Mechi had been led to make assertions which he was afterwards obliged to contradict. He would not say one word against Mr. Mechi as an enthusiast. He admired enthusiasm in any man when properly directed, and he congratulated him on many of his experiments in agriculture; but he decidedly objected to his laying down rules for the guidance of men who had been engaged in agricultural pursuits the whole of their lives. He was, however, glad to hear the admission which Mr. Mechi had made to-night, and he thought it might do something towards smoothing the way to the valuation that was to be made on the 31st of Oct., at Tiptree (Hear, hear, from Mr. Mechi). He (Mr. Tattersall) quite agreed with what Mr. Sidney had said respecting the security of tenure, and also with respect to leases. He would simply read a few extracts on the point, in reply to that gentleman's speech, from a pamphlet which he had written about three years since :

"What class has gained by recent legislation except the monied interest and the fundholder, is a discovery yet to be made; and unfortunately neither the monied interest nor the fundholder subscribe in their fair proportions towards the employment and maintenance of the poor, and consequently it has become impossible for the country to support the poor in profitable employment.

"The question of *tenant-right* has not met with the encouragement it deserves, because it is not yet understood; still let it be urged under a better name than 'tenant right;' for it is the right of LANDLORD, TENANT, and LABOURER.

"Let every gentleman read the 'Digest of Evidence on Agricultural Customs,' by Messrs. Shaw and Corbet, and he will be, upon calm reflection, as satisfied as I was in 1845, from the result of practical experience and personal observation in my business as a valuer of agricultural estates and covenants, that in a better understood, more comprehensive, and universally *fair custom of the country*, lies hid a gem of inestimable value to every class connected with agriculture, and therefore to every interest in the state.

"A good 'custom of the country' is, in my opinion, far better than a lease; it binds neither party to a bargain of which either may wish to get rid. It does not tie a landlord to a disagreeable tenant; it does not tie a tenant to an exacting landlord. Under a lease an unpleasant tenant may annoy a landlord for years, and render himself a perpetual blister; and this is the reason why many gentlemen will not give one.

"Under a lease a bad farmer may half ruin an occupation by bad cultivation, and yet by keeping within certain bounds steer clear of the pains and penalties of an instrument which cuts only on one side; may employ only half his fair complement of labour, and thus demoralise a parish for years to come. I know an instance in point where the effect is now shown, although the author of it has been long since gathered to his fathers.

"Under a lease a tenant may unintentionally offend a landlord, and may be in various ways made uncomfortable, besides, that at the expiration of his term, it is not his interest to farm the land to the highest point. Under a proper system of *landlord and tenant right*, the interest of both would be far more effectually protected; each would feel more at liberty, and at the same time more confident, and in no way could you invite *capitalists* to embark their money in land, with such a certainty of success.

"The consequence of this state of things would be, that the landlord would get more rent; that the farmer would employ more capital and produce more corn, because it would then be his interest *always* to keep his land at the highest point of production, while, under a lease, during the last four years, it is not.

"And lastly—that the beneficial employment of the labourer would be increased to an incalculable extent, and there would be no able-bodied paupers in the union-houses in the agricultural districts, *unless corn falls to such a price that the foreigner beats the Englishman out of his own market.*

"What I undertake to prove in practice as well as in words is this, that it is better to have a lease than to be a tenant-at-will under the present system; but that a good system of *landlord and tenant right* is better than a lease, and would tend more to the prosperity of all classes connected with agriculture.

"This can be carried into effect by a proper agreement between parties; but as each case may have its peculiarities, it will be as well in all instances to have the assistance of some one who has studied the question, and is practically master of his business.

"In passing through any agricultural district, the traveller of observation cannot fail to have remarked how much better some farms are cultivated than others, possessing equal advantages of situation, aspect, and soil.

"On one side of the road he will observe fields in the highest state of cultivation; on the other weeds have usurped the place of corn, and to the most inexperienced eye bad farming is apparent. A single instance of this kind might lead to the conclusion that one farm was held by an active, intelligent, and enlightened man; whilst the tenant of the other was lazy and indolent, and neglected his business; and this in a few instances might be true; but there is a general cause too little thought of, too little understood. One man farms under a lease—the other is a tenant-at-will; one man has for a time a greater interest in the soil than the landlord himself, and therefore forces its cultivation to the highest point of production; expends upon it his *capital* and *labour,* and knows that he shall reap the benefit of so doing.

"The other, holding upon an insecure tenure, liable to quit his farm at a short notice, dare not employ his *capital* and *labour* to anything like a similar extent—hence the difference—here lies the evil, and it is one of fearful magnitude in its operations. A tenant-at-will cannot be a good farmer under the present system of covenant valuations, unless at a great risk, and by placing himself entirely at the mercy of his landlord. Let no tenant then accept a farm without a lease, or without an agreement, *that if he quits his farm he shall be paid for the beneficial interest of all improvements that he has made upon the farm, still remaining in the soil, either by underdraining, manuring, or in any other way, and the more explicit such an agreement is the better.*

"I do not know the proportion of land held upon this insecure tenure, but I know that it is a very large one. Few landlords, who know their own interest, will object either to grant a lease or to agree to some such arrangement as I have suggested, and those who do will find that good tenants will avoid their farms. This is an evil that requires for its cure only the exercise of good practical sense and judgment on the part of landlord and tenant; it only requires that they should do that which is to their mutual advantage and of immense importance to their poorer brethren; for I think upon a moderate calculation one third if not one half more labour would be expended upon every farm, now held from year to year, if at Michaelmas next it were let upon lease, or under a proper agreement. This alone would open a wide field for the operations of labour, as the farmer, who knows his business, knows that there is nothing so cheap as labour properly applied.

"Leases also require a great alteration in the covenants introduced, most of which run in the same form of words adopted a century since, and bind the tenant to a certain rotation of crops, tying the hands of the farmer, and reducing him to the state of an automaton. Now this is an absurdity; as if no improvement in farming had been made in the last twenty years! as if no improvements were likely to be made in the next twenty years! And yet a twenty years' lease taken now would bind a tenant to a certain rotation of crops.

"Now this is far too arbitrary; it restricts an enterprising man, and does not prevent the land from being injured by the bad farming of an ignorant or careless tenant who keeps within a certain rotation. In a better system of farming leases, or in the absence of leases, in a better defined and more liberal custom of the country, lies hid a mine of wealth to be elaborated by a vast amount of capital and labour—the birthright of our poorer brethren."

He thought that this, in a great measure, met the objections urged by Mr. Sidney, who had made a speech which would tend to do good, although he started by affirming what was not the fact — that he (Mr. Tattersall) had almost talked a revolutionary doctrine! He did not agree, however, with Mr. Sidney, because he stated most decidedly that he would suggest that the Chancellor of the Exchequer should lay the annual calculation on the currency before Parliament; and if Parliament did not agree to it, of course it could not be carried out. He had referred to the gulf that was widening between the rich and the poor, and he thought he could refer Mr. Sidney to the present amount of poor-rates in support of that assertion. He was certain that there was a larger amount of paupers at present than had been known for many years, and the probability was that it would continue for several years to come to increase.

Mr. MECHI: The poor man was never better off.

Mr. TATTERSALL resumed: He was of quite a different opinion. He was very glad that the discussion had brought about Mr. Baker's speech, because that gentleman gave a great many facts which would go far to prove that it was very difficult for any man to farm to profit at the present moment, of which he (Mr. Tattersall) was fully convinced. He was happy to hear Mr. Acton state that legislative enactments were going on that were likely to tend to bring about that which was generally considered so beneficial. And he cordially agreed with Mr. Lawrence, that a return to Protection was the best of all plans, although he had refrained from saying so. He would only add, with regard to the currency, that he thought, if properly managed, it was the life-blood of the state; and he regretted that sufficient attention had not been given to it. He thought, however, that although it was a very difficult subject to discuss at any time, it was worthy their attempting to understand (Hear, hear). It was not his intention to talk about Free-trade in Mr. Sidney's sense of the word, but he could not refrain from mentioning it to-night as one of those things which were depressing the landed interest in every point of view. He did not argue it as opposed to Protection—he used the word in its simple meaning, as he would have done in any other discussion. In conclusion he would say, that although gentlemen had differed from him, he was, he must confess, "of the same opinion still."

Mr. SHAW then rose, and said: I believe it devolves upon me to say a few words upon this question. And first of all, I beg to express my satisfaction at seeing a new member amongst us—a gentleman whom I have never seen before, and who, I have no hesitation in saying, if he were to attend often, would very much tend to promote our keeping to the question under discussion, and prove a valuable member of the club (Hear, hear). Having had several years' experience in this club, I have felt great satisfaction in hearing how succinctly, how briefly, and yet how emphatically, he made his observations. As far as regards the currency, I have a sort of hydrophobiacal horror of it, which always induces me to avoid it. Although, nearly thirty years ago, I was a dabbler in it in the columns of the local newspaper, yet I have never been able to see my way clearly through it (Hear, hear). Our friend here (Mr. Tattersall) talks of the Chancellor of the Exchequer regulating the currency; and Mr. Sidney has said something about this being a socialist view. I apprehend that the proposition as put is simply this: Is it to devolve upon the government to regulate how the trade of the country is to be carried on? or is it to be left to the ordinary course of private enterprise and management? Now, there is one point that has always staggered me, with respect to any proposed scheme of regulating the currency. Mr. Leatham, a banker, of Wakefield, than whom none better understood the question, wrote a pamphlet on the currency, which afforded me more gratification than any publication I ever read, and which I recommend to the perusal of every gentleman who wishes to be informed on the subject. He states specifically, what no man will deny, that the real expansion and contraction, and the consequent amount of the currency, depends upon the amount of trade—that what is called the money of the country is a mere flea-bite compared with the circulation, inasmuch as you have something like three hundred million of bills of exchange afloat, when business is tolerably brisk. Let business decrease, and the currency contracts, as it does when there is a want of confidence. Hence I have never been able to see how it was possible for more to be done than to endeavour to prevent that which it is extremely difficult in this country to do, namely, to control that speculative disposition which we, as Englishmen and as merchants, exhibit, and to take care that we do not now, as was done in 1845, and on many former occasions, go a-head too fast; and if any complaint has to be made to the course which Sir Robert Peel took on that question, in respect to cramping or fettering our speculative disposition, I am rather disposed to think that he was acting upon the right principle (Hear, hear). We are more apt to run riot, if we can do it, with paper, than we are to be cautious in using it. I am sorry that the discussion has not taken so close a turn, in connection with the subject on the card, as I had hoped it would have taken to-night. We have had some valuable information, and none more so than from Mr. Baker; because, as I took the liberty of throwing out at our annual meeting, what we want at the present moment is detailed statements of the cost of farming in various parts of the country, from persons who are competent to give it; and I believe if we could get that, in the manner Mr. Baker has given it to-night, it would have more effect in opening the eyes of the country than anything else (Hear, hear, from Mr. Mechi). Hence I think such information exceedingly valuable. But there does not appear to have been half so much said upon the subject on the card as I should have wished; so that it is extremely difficult to do that which we endeavour on these occasions to do—to draw up a resolution embodying a conclusion as to the result of our discussion. The gentleman who spoke last (Mr. Sidney) did, however, refer to one or two points that certainly bear on the question, and afford us additional materials for framing a resolution. I have sketched out a resolution for your consideration, and I will now propose it, in order that opportunity may be afforded of altering in any manner you may see fit.

"That as regards the investment of capital in the purchase of land, the simplification of titles and the facilitating of transfers by a well regulated system of registration would materially induce the investment of capital.

"That with respect to the investment of capital in the cultivation of the soil, a reform in the construction of the clauses in ordinary leases and agreements, with permission to remove buildings erected by the tenant, and compensation for unexhausted improvements, would materially conduce to the investment of capital by the tenant farmer; but

"That it appears, from statements submitted to the meeting, that the cost of raising agricultural produce preponderates so much over its present value, that either an increase of prices or a reduction of expenses must take place before capital will be freely invested in the cultivation of land."

The resolution was seconded by Mr. Owen, and carried unanimously.

Votes of thanks to Mr. Tattersall and Mr. Shaw were passed, and the proceedings terminated.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

SIR,—At the discussion which took place at the Farmers' Club, some remarks offered by myself may require explanation, and it is with this view I have drawn out a statement of the expenses of cultivation, accompanied with remarks and explanations that may render it more easy to be understood by persons unacquainted with the processes and expenses of farming. The statements given by me are deduced from data founded upon actual experience of many years, with a view of rendering them applicable to every description of soil. The amount of produce must depend upon the quality and condition of the soil, and the skill of the cultivator; and in those statements rendered, it will be found to exceed the average quantities of any but the most highly cultivated farms of the eastern and southern counties. From 28 bushels to 32 bushels of wheat per acre will comprehend the range of the Essex farms, and from 40 to 48 bushels of barley. The estimate given by myself on well farmed lands, in the essay upon the agriculture of this county, for which I was honoured by receiving the prize from the Royal Agricultural Society, is as follows :

Average—

Wheat.	Barley.	Oats.	Peas and Beans.	Clover.
30 bush.	44 bush.	52 bush.	30 bush.	1¾ tons.

By a statement obtained from a survey of this county by — Vancouver, in 1793, the quantities given are as follows :—

Wheat.	Barley.	Oats.	Beans and Peas.
22¾ bush.	34½ bush.	33 bush.	20½ bush.

And I beg to remark that this survey must have been conducted with the utmost care, as the amount of rent, tithe, rates, and every outgoing, as well as the amount of produce, is given of every parish of this county with an accuracy and detail that must have taken a vast amount of labour to have produced.

The average amount of rent of the enclosed arable land was 14s. 8d. per acre, and of meadow land 25s. per acre. The presumed rental as paid at the present time may be assumed at about one-third more, viz., arable 22s. 6d., and meadow 32s. 6d., which pretty nearly accords with the increased quantities produced ; but the incidental expenses are much higher now than at that period.

The horse labour is stated at 20s. per acre, upon the assumption that four horses are necessary for the cultivation of each 100 acres, mixed, arable, and grass farms, in the proportion of 10 per cent. grass.

The manual labour is calculated upon six men to each 100 acres arable, at 8s. per week, and extra for harvest being exactly £26 10s. each man ; but as some grass land is found upon each farm, 30s. per acre fairly represents the cost at the present moment upon each acre.

The bills of tradesmen are exactly upon what is paid—

	Per 100 acres.	Per acre.
Blacksmith and iron founder	£10	2s.
Wheeler	£5	1s.
Harness maker	50s.	6d.
Thatcher	50s.	6d.
Repairs and insurance	£5	1s.

These charges are moderately assumed, and are below rather than above the actual charges.

The seed corn and other expenditure are upon actual calculation, and the keep of the horses is also estimated, varying from 1 bushel to 2 bushels of oats per week, and 1½ cwt. hay cut into chaff, with straw, or the ordinary green food at 6d. per day ; in addition to which is added, for depreciation in each horse, 50s. per annum, on the supposition that each horse costs £30, and works twelve years.

The produce of each farm can be estimated, and by adopting the foregoing data landlords may ascertain to what extent rent ought to be reduced, and which will enable them to perceive what is the true position of their tenant, and how far he deserves consideration at their hands.

I am, sir, your most obedient servant,

Writtle, May 9, 1851. Robt. Baker.

Sir,—At the conclusion of the few remarks I made on Monday night at the meeting of the Farmers' Club, after stating that I thought an improved method of legislation might be introduced, I forgot to state that legislation, to be useful, must connect the interests of both parties interested ; and the great opposition to Mr. Pusey's bill seems to have increased, by a supposition that it created a fixity of tenure, and engendered a want of confidence between landlord and tenant ; but, sir, whatever you may do by legislative enactment, you can do by private agreement, and with better grace ; and I see no reason, when the tenant is properly protected, why capital should not be invested in land. This is what I advocated in the *Law Magazine* in the years 1849 and 1850, and I see no reason to alter my opinion.

By allowing these few lines to be inserted by the printer in your forthcoming paper, you will confer on me a favour ; especially as nature has denied to me a gift which she has amply bestowed on yourself.

I am, dear sir, yours truly,

Edward Robert Acton.

London, May 7th, 1851.

ON THE ERADICATION OF WEEDS.—INFLUENCE OF CLIMATE ON THE CULTIVATION OF LAND.

"We think little of a few weeds; they never appear but in the corn crop, and are not difficult of extermination," is sometimes heard from parties who find it impossible to both grow frequent crops of corn and keep the land clear of weeds. But it is a mistake. Weeds take away from the soil exactly what crops will do, and they generally fulfil all the conditions necessary to impoverish the soil so far as to place them in the category of exhausters of the land.

They are usually of rapid growth, and tend, therefore, to overtake the corn; so that many a crop which would otherwise have withstood the more unfavourable conditions of soil, situation, or climate, is overpowered by the rapid growth of the weeds until it is utterly spoiled. But another principle applies. They soon become mature; and a matured plant will exhaust the soil much more than one which is yet in its state of greenness.

But more; we find a bad crop of grain, or seeds, or turnips, always the most fruitful of weeds. It shows that the land is not utterly barren, that some plants will grow, and it is only for the agriculturist to select a proper kind in order to get a crop. It is only in rainless deserts that no vegetation will grow; the sea is not less fruitful in it even than the land; for there are trackless submarine forests of the algæ below, as there are forests of elm, of oak, and of pine above the surface of the land.

We well remember a farmer saying that his land would not grow swedes; he was told, not improperly, that any land would grow swedes which would grow a thistle. And it is so. Prepare and manure properly, and the land which will grow weeds plentifully will also grow the turnips, the clover, and the wheat. But if weeds are to be exterminated, more green crops must be grown, and less corn. The pocket will not, we are certain, in the long run, suffer by this. Green crops will feed stock, sheep especially, and no stock has paid like sheep; they will fill the farm yard with manure, and fertilize the land, and so render future crops more easy to obtain, and less expensive; they will check the production of weeds, which cannot run to seed by any possibility so long as these crops are growing. The poppy or the wild mustard—two plants, again, the pests of strong land and light, as were the two we last week mentioned—the one covering the corn with its scarlet, and the other with its yellow livery—are only to be eradicated by a succession of green crops. And we will see how this is accomplished.

We will suppose frequent crops of corn, and we have these seeding—shedding part in the field, and laying the foundation of a future produce—part being carried to the barn, to fill the seed corn with its subtle and insidious progeny, and part carried off in the straw to impregnate also the manure with its modicum of mischief. Now green crops reverse all this. They not only put a pure negation upon all these disseminations of seed, but they, by the ploughings in the spring, tend to promote the germination of inert seeds, expose them to the air just sufficiently to destroy their vitality afterwards with ease and safety, by ploughing them up. But even in the after crop the plant is so hand-weeded, and horse and hand-hoed, that it is kept under without difficulty; and, as the plants are never suffered to mature their seeds, it soon ceases to exert that fell dominion which it otherwise would obtain.

And even a clover field, whether mown green or eaten with sheep, will prevent, to a very great extent, the extension of weeds. The clover is generally mown two months before the harvest, and there are very few plants which have matured their seeds at that period, even if it be mown for drying for the purposes of fodder. But if it be cut green or eaten with sheep, there is not the remotest possibility, with the exercise of ordinary care, of either of these plants becoming, to any very serious extent, injurious. But let us have successions of corn, and no care, no skill, no attention, nor expense can prevent an overgrowth of weeds.

When once in corn crops, it is not easy to show how to eradicate either the one of the plants we have named or the other. Mr. Paul, who has had great experience in farming matters, and is a close observer, once assured us that, if the bush harrows were sent over the barley in a hoar-frost morning, when the poppies were above ground, the leaves would blacken, and the plant die. We have not had an opportunity of making the trial, but it is worthy at least the trouble, for it is not likely that the barley will suffer much by the process, and there are generally white frosts early in the mornings in spring to admit of a trial.

In the wild mustard we know of no palliative, nor cure; it must be vigorously and carefully hand weeded; and, if it is not, the turnip crop may be expected to be infested with the fly, being nursed and fed upon this most dreadful scourge to the farmer. Still, as prevention is better than cure, and as corn pays so badly, remove the corn crops, we would say, as far from each other as possible.

One of the greatest difficulties experienced by the British farmer in cultivating his land is doubtless the influence of his climate. On the backbone ridge of England the rains are so excessive that it requires great skill to keep the land free from weeds by the farmer availing himself of the few intervals of fine weather which now and then occur; otherwise, the all but incessant rains will render the destruction of the root weeds next to impossible. Hence you see a red soil in Westmoreland in all respects similar to one in Essex, the one clean with indifferent farming, the other foul with good; and this is just because so much more rain falls at Appleby than at Colchester—that the couch is difficult to keep under in the one place, and but little of an inconvenience in the other; inasmuch as it so likes dampness as to over-run a piece of land insufficiently drained, while in a drained piece it will be almost entirely absent.

So again, the wheat can be cultivated with success in valleys, but need not be attempted on the top of the hills almost immediately adjoining, even though the soil may be better in the latter than the former. Nor is the range of root crops less various. In the dry counties of Gloucestershire (parts of it), Somersetshire, and others, there is often great difficulty in obtaining sufficient moisture either to enable the seeds to germinate, or, when grown, to produce bulbs of any useful size; while in the more humid north they seem to be in their natural element.

We are induced to make these observations, having before us the report of Mr. W. Palin on the cultivation of the farms entered for the premiums of the Denbighshire and Flintshire Agricultural Society, where the effects of climate will sometimes seriously interfere with the successful cultivation of the soil.

We select from the report the outlines—the very words are well worth quoting, but we have not space—of the management, in its most important particulars, of a farm of 320 acres in the parish of Ruthin; we think, Pool Park, in the occupation of Thomas Turnor, Esq.

The rotation is one suited to the locality, and is capable—while it is a strict *system*—of a certain degree of expansibility. Commencing with wheat on ley; this is dressed with guano in April with as much as 2 cwt. per acre, affording a stimulus to the plant at the time when it so often suffers, especially in rainy districts or exposed situations, or sometimes 60 or 70 bushels of soot per acre are substituted. Then follow turnips, partly raised with farm-yard manure and guano, and partly with town manure, sometimes with phosphates; but these sometimes do not answer, probably from the system being one in which it is supplied in another form. Then follows barley, which is sown with 14lbs. of clover and grass seeds, and 6 pecks of rye-grass per acre. Having thus obtained a full plant of clover, this is mown and dressed in winter with four or five tons per acre of lime compost. They are then depastured, and if the plant continues good are again depastured a second year; but if they are, corn and oil-cake, or some kind of artificial food is given; and strange as it may appear, this six-course is more favourable to the clover than the five-course, though under this management the land is seldom clover-sick. Sometimes the seeds are manured. But not only is the system expansible, but it is also sometimes alternated with another course, which may be thus described: Oats on second year's ley (cleaned in autumn) and manured; then winter beans, *horse and hand hoed, and turnips sown between the rows* in June; then wheat, afterwards turnips, then barley and seeds. These clovers mown, next year top dressed and depastured. Sometimes, however, it is necessary to substitute oats for the wheat on the higher lands.

Now there are several remarkable peculiarities here. Though the climate is bad and the soil heavy, there is no open fallow. The clearings for turnips, of the seed leys in autumn, and of the winter beans, are sufficient to keep the land clean; while the repeated dressings keep the crops in heart, and above the invasion of weeds. These dressings are remarkable. Extraneous manures for the turnips, artificial hand tillages to the wheat in April, lime compost to the seeds, and purchased food for the sheep, while eating the seeds, is a system of farming which must answer if good husbandry will ever pay.

But the most remarkable fact is, that the land is allowed to rest one half of its time in red clover—or at least, three years out of the six—or two out of the five—and does not become clover-sick. Now we think there are two reasons for this: First, the frequent importations of manure supply the matter, whatever it may be, necessary to the development of the clover; or that the land is improved in cultivation, and therefore has not been under that plant a period sufficient to render it sick of that crop. A single fact given tends to show that the latter may be the solution. A portion—the northern—about nine acres, failed of *red* clover. In 1845 the whole field was sown with seeds after barley; the southern part with white clover, trefoil, and Italian rye-grass. The northern part was sown with red clover alone. In 1849 the whole had the uniform seeding referred to above. The red, therefore, failed on the southern part, owing to clover sickness; while the second crop was as promising and good as the first in the southern part. Is not this indicative that when a full crop of red clover is taken, the land is exhausted of clover food?—Gardeners' and Farmers' Journal.

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

(From the Morning Chronicle.)

Letter XIX.

NORFOLK, SUFFOLK, AND ESSEX.

With the single exception of Lincolnshire, there is perhaps no county in England which has made such rapid strides in agriculture as Norfolk. The farmers are almost proverbial for the readiness with which they undertake improvements, and for their great desire to arrive at perfection in the machinery by which the cultivation of their land is carried on; and in nothing perhaps is this feeling more strongly exemplified than in the fineness of the "tilth," or surface of the soil, owing to the great number of ploughings bestowed upon the land, and to the complete pulverization of the clods by the various formidable-looking machines used for that purpose.

It is but a comparatively short time since the county of Norfolk might have been styled, with the utmost propriety, a county of warrens and sheep-walks. The farmers of those times, destitute of that ardent desire for improving their farms which now characterizes them, where content to follow in the track laid down by their ancestors; and so long as they were able to obtain, by a small amount of exertion, some eight or ten coombs of wheat or barley from the land which they might have under tillage, they appear to have been perfectly satisfied. To the untiring exertions and liberal policy of the late Earl of Leicester is mainly to be ascribed the present high position which Norfolk holds among the agricultural counties of England. Large quantities of fens have been reclaimed, and barren heaths have been cultivated; and where they formerly existed, the most luxuriant crops of wheat and barley are now obtained. In many of these districts as much as fourteen and sixteen coombs of wheat to the acre have been produced, and from sixteen to twenty of oats—a coomb being equal to four bushels. Taking the average of the county, it has been calculated that the produce per acre is from six to eight coombs of wheat, and from ten to twelve of barley.

With respect to the character of the soil of Norfolk, it is exceedingly varied. It has been said of it, that "All England may be carved out of Norfolk, for here are fens and heaths, light and deep, sandy and clay grounds, meadow lands and pastures, arable and wood lands." In the east and north-east parts of the county there is a great quantity of vegetable and alluvial soil, with rich loam interspersed with portions of sandy and gravelly soil. In the neighbourhood of Norwich the soil is gravelly; near Acle, clay abounds; and adjoining it a fine vegetable soil of great depth is to be met with. From thence to Yarmouth there is an extensive district of marshy land. Towards the north, also, there is an extensive tract of marshes, which, in winter, are almost always under water, and produce only a coarse kind of feed, or "rowen." In consequence of these marshes being the property of a great number of small proprietors no really efficient system of drainage has yet been attempted. In the neighbourhood of Holkham, the seat of the Earl of Leicester, the soil is, for the most part, a light kind of loam and gravel, upon a substratum of chalk and marl; between Wells and Holkham the soil is particularly fine. About Castleacre and Newton the soil is generally of a light gravelly nature, but there is a great deal of very good and productive land. Near Downham and Marshland there are immense quantities of fen and marshy land. In the neighbourhood of Downham, I was informed, some land had been sold, within the last five years, at £45 per acre, which, a few years since, was not worth more than £7 an acre. In that part of the county lying between Brandon and Thetford a great proportion of the land is merely sheep-walk, and some portions of it are let at as low a rate as 3s. 6d. per acre. About Taverham and Drayton the soil is light and sandy, and almost entirely upon a subsoil of chalk. It is computed that there are, of light sand, 140,800 acres; of good, 268,000 acres; of marshland clay, 38,400 acres; of various loams, 576,000 acres; of rich loam, 94,720 acres; and of peat, 52,480 acres, within the county. Of these various kinds of soil there are 50,000 acres of unimproved common heath, 60,000 acres of sheep-walk and warren, and 15,000 of wood and plantation. Assuming these numbers to be accurate, there would be not less than 1,045,760 acres under cultivation within the county of Norfolk; and of this quantity it will not be too much to assume that one-fifth, or 209,152 acres, are pasture, and the remaining four-fifths, amounting to 836,618, arable land. It is somewhat difficult to form an estimate of the value of the agricultural produce of this county. In some parts the crops are wonderfully large. I was told, at Fakenham, by a farmer, that he had never known the crops so fine and so heavy as they were this year in the Holkham district. Great quantities of the land had produced from 14 to 16 coombs to the acre. "The crops," said he, "are such that we can defy all price." Let us assume that £7 per acre represents, upon an average, the gross produce of an acre of arable land—and £6 that of an acre of pasture. There is no reason whatever to suppose that the produce of Norfolk is below the average; and in the absence of more accurate data on the subject, we must assume that the gross value of the produce of the arable land is not less than £5,856,326, and of the pasture land £1,254,912—making a total of £7,111,238, as the gross value of the produce of the land under cultivation in the county. The average amount paid for tithe, as calculated from a list of forty commutations, is—for arable land 6s. 6d., and for pasture 2s. 5¼d. per acre; which gives as the total amount paid upon arable land £271,906, and upon pasture £32,779, or a total upon arable and pasture of £304,684. The quantity of rape and linseed cake imported into the county in 1843, for the purpose of feeding and fattening cattle, was 26,366 tons. The total quantity of grain and flour exported from the various ports in the year 1843 was 536,766 quarters. Of the quantity of bullocks, sheep, and pigs fattened in the county, I have not been able to obtain any information upon which reliance could be placed; the quantity, however, must be enormous. The cattle market at Norwich is one of the largest in the country; but as the market is rented of the corporation, the parties having the management uniformly refuse to give any information as to the actual number of cattle or sheep sold there. Some idea of the immense quantity sold at the market, may, however, be formed, from some returns which were published on the subject in 1837, from which it appears that the quantity sold at Norwich market during the year 1836, was—of sheep, 214,480; pigs, 29,207; cows and calves, 4,032; beasts, 40,390; and horses, 1,882; and I have been informed that since that period the quantity has considerably increased. At Lynn market, in 1843, the numbers sold were—sheep, 53,665; pigs, 25,172; and bullocks, 16,368.

One of the main causes which have led to the great improvement in the cultivation of Norfolk has no doubt been the almost universal adoption of giving leases to the farmers. In order to reclaim the thousands of acres which formerly were mere barren heaths, a large outlay of capital was necessarily required, and it was not to be supposed that farmers would invest their capital in undertakings of this sort unless they were guaranteed such a permanent possession of the land as would in all probability allow of a fair return upon their investments. In order to afford this necessary security, the late Earl of Leicester adopted the system of granting leases of fourteen and twenty-one years to all his tenants. Following his example, most of the other large landed proprietors of the county adopted the same course, and at present there are comparatively few farmers in Norfolk who do not hold their farms upon leases. Mr. Burroughes, M.P., the member for East Norfolk, and a proprietor of upwards of 8,000 acres, has within the last few years given leases to every one of his tenants. Lord Wodehouse, who is also an extensive proprietor in the neighbourhood of Wymondham, has also given notice to those tenants who have not already obtained leases, that he is prepared to grant them upon the most just and liberal terms. The beneficial effects of granting leases are perhaps nowhere to be seen more strikingly than in the county of Norfolk. The appearance of farms cultivated under lease, as compared with those belonging to yearly tenants, is such as cannot fail to strike even the most superficial observer. The farms held under lease may, in almost all cases, be distinguished by their high state of cultivation, the neatness and trimness of the hedges and fences, and the good state of repair in which the houses and farm-buildings are universally kept. The question of leases is one also which bears intimately upon the condition and well-being of the labourer. A person holding a farm under a yearly tenancy will be careful not to expend more, either in improvements or in labour, than he considers will be repaid by the value of the crop; his expenditure will be only proportionate to the interest which he possesses in the land. On the other hand, the farmer who feels that he has a security for a number of years in the produce, will naturally exert himself to the utmost in the cultivation and improvement of his farm; and in proportion as he does so, will he be able to give an increased amount of employment to the labourer. And from all the inquiries which I have made upon the subject—and I have taken some considerable pains to inquire into the matter—I am firmly convinced that a far greater proportion of labour is employed upon farms held under lease than upon those held under uncertain tenures; and not only is there in such cases an increased amount of employment for the labourer, but he is also generally better paid, and his condition is in every respect more comfortable. As to the periods for which the leases are granted, considerable discussion has taken place among those immediately concerned in arriving at a satisfactory solution of the question; and various terms have been mentioned to me, each of which has been supported by a considerable show of argument. It appears, however, to be admitted upon all hands that leases under fourteen years would not secure to the tenant a fair return for the additional outlay which he would be supposed to make. Several farmers with whom I have spoken on the subject advocate very strongly the insertion of renewal clauses in the leases, which, in the case of a fourteen years' lease, would give to the tenant the option of renewal at the end of ten years, and in cases of leases of twenty-one, a renewal at the expiration of fourteen years. In the leases which have recently been granted by Mr. Burroughes, clauses are inserted, giving the tenant compensation for unexhausted improvements upon the expiration of the lease. This arrangement is one which has given very general satisfaction to the tenants, and if universally adopted would tend to remove any apprehension as to the injury which the land might sustain during the small unexpired term of a lease, in consequence of the tenant withholding from the farm its fair proportion of labour or improvements.

Great numbers of farms are, however, still let by the year; in some cases it being stipulated that twelve or eighteen months' notice shall be given by the landlord if he wishes to remove the tenant, and by the latter if he desires to give up his occupation. But when the landlord is the party desiring to remove the tenant, he is bound to pay to him the value of all unexhausted improvements. The interests of the labourer are also deeply affected, in addition to the extent to which the practice of giving leases may prevail, by the nature of the covenants as to the cropping of the land. Many of the compulsory clauses which at present regulate the rotation of crops and the mode of cultivation, operate injuriously to the interests of both the tenant-farmer and the labourer. There is a very general feeling against the continuance of many of the old compulsory clauses. There are but few cases in which a tenant, holding under a long lease, can cause any injury to the land by the system of cropping which he may adopt, without inflicting upon himself even a greater amount of injury. One large farmer, who farmed upwards of 1,000 acres, gave me as his opinion—and assured me that it was one very generally shared throughout the country, both by landlords and tenants—that when once some general rule as to cropping was laid down, the less the farmer who was disposed to invest his capital was interfered with or fettered by arbitrary clauses, the better would it be for the landlord, the tenant, and, above all, for the labourer. "I know," said he, "a case where there are clauses which prevent the farmer from drilling his turnips and from mowing wheat; and another which prohibits him from 'shacking the stubble,' and even letting the sheep feed off the wheat stubbles before October. Why, when a man is hampered with such regulations as these, how can he cultivate the land, or employ as much labour as he might wish on his farm? The fairest and most proper covenants that I know of are just these—and I don't think anybody could object to 'em, because they're for the good of all parties. I wouldn't allow of two white crops following each other. I wouldn't have any pasture broke up, and I'd let the farmer sell his hay, his straw, and even his green crops, so long as he laid out as much as he sold 'em for in artificial or other manure. Well, then, when there was any draining to be done, a part of the expense should be paid by the landlord, and not all by the tenant."

The clauses in the agreements which most injuriously affect the tenant farmer, and through him indirectly affect the labourer, are those which reserve to the landlord the exclusive right of shooting game. Vast quantities of game are preserved in Norfolk, and a very general and wide-spread feeling of dissatisfaction exists upon the subject among all the tenant farmers with whom I have spoken on the subject. The great difficulty appears to be as to what should be the amount of remuneration to the tenant for the loss that he sustains by the depredations of the game. The system at present adopted is that of making a certain reduction, agreed upon by both parties, from the rent. The farmers, however, complain that a fixed amount of reduction does not meet the case fully. The injury done by the game frequently exceeds very considerably the amount allowed as compensation. This evil is more particularly felt in the neighbourhood of large preserves, where the quantity of game has been allowed to increase to any very great extent. I have been informed of several cases in which the loss by game has been enormous. Upon one farm, twelve acres which were sown with barley did not yield more than forty coombs, while the average yield ought to be from 90 to 100 coombs. In consequence of this continued falling off in the crops, and the inability of the farmer to obtain anything like adequate compensation, the amount expended in labour had fallen off to one-half; and no labour of any kind, except what was absolutely necessary or required by the covenants, was performed upon that part of the farm. "I should employ ever so many more men," said the farmer to me, "in draining and trimming the hedges; but it is no use, the birds eat up all the profit." There is one complaint which I have frequently heard made by the farmers in connection with the game, that is, that the numbers are not kept down so much as they were formerly—that the destruction of the game is not "steady." The railways, they say, have increased the facilities for the friends of the squire to visit him, and the game is usually reserved for the periods at which the visitors and guests may arrive. Another reason why, they say, there is not so much shooting going on daily, is because the owners do not wish to make the birds shy by too frequently visiting them, as by so doing they would not be able so easily to supply the large quantities to the dealers in game who are in the habit of purchasing of them. This system of reserving the game for "battues" of this kind is, if not loudly at least very generally, complained of by the great body of tenant farmers; and in too many cases it operates most prejudicially to the interest of the labourer.

So completely identified with the state of agriculture are the interests of the agricultural labourer, that it is impossible to fix upon any one of its various phases, or to consider any of the modes by which it is carried on, without being at once led to connect with it its effects upon the condition of the labourer. Not only is he interested in the tenure by which the land may be held, and the covenants by which his employer may be bound, but he is also interested to a great extent in the system of cropping which may prevail in the district in which he resides, and upon the farm on which he is employed. A few years since the "six course shift" was the one most generally adopted throughout Norfolk. Under this system two white crops were generally taken in succession. These were followed by turnips, barley, and sometimes oats; and the course was invariably finished by a two years' layer. Under such a system it is obvious that the whole of the land could only come under tillage once in every six years. For some parts of the county the "five-course shift" prevailed. A number of varieties were introduced in connection with the five-course shift, into which it is obviously not my province to enter; but the object of the farmer in all such cases is to employ as small an amount of capital as possible, and to secure the largest return for the smallest possible outlay. The rotation of cropping which is now most generally adopted, especially in the western division of the county, is the four-course shift. In some portions of the county, in the neighbourhood of Cromer and in the hundreds of Tunstead and Happing, the six-course is still adhered to—while near Fellrigge, and in some portions of Flegg, the five-course is still adopted. In the fen district, and in marshland, wheat and beans are grown without any intervening crop; and such is the extraordinary fertility of these districts, that the same course has been continued for upwards of twenty years. There can be no doubt whatever that the adoption of the four-course shift, setting aside the fens and marshland, is the one which affords the greatest possible amount of employment to the labouring classes, inasmuch as the whole of the land comes under tillage once in four years, instead of once in five or six, as would be the case under the five and six-course shift. The old notion that it is necessary to allow the ground to remain for one year in the four, five, or six, as "dead fallow," is in most parts of Norfolk completely exploded, and it is generally found that no difficulty exists in keeping the ground clear by a judicious system of green cropping.

The comparative effects upon the labourer, of large and small farms, has for many years been a *vexata quæstio*, which has been agitated with more or less violence in the whole of the eastern counties of England. It is a question of considerable importance, the satisfactory solution of which would be attended with a vast amount of good. The limits of a single letter would barely suffice to enter fully into a consideration of the various arguments, *pro* and *con*, which have been advanced upon either side. Feeling strongly that it was a question deeply affecting the interests of the labourer, I made it my business to make somewhat extensive inquiries as to the opinions entertained upon the subject by the farmers, and even by the labourers themselves. The man whose farm is too small for his capital is far more likely to afford increased employment to the labourer than the farmer whose holding is too large for his capital. I have been repeatedly told that the small farmers were constantly suffering from the want of capital, and unfortunately they appear to have many companions in this respect among the larger occupiers. The small farmer who may bestow his own labour upon his farm, may, and often does, struggle on against difficulties of an almost overwhelming nature; but the privations which his want of capital necessarily produce are shared only by himself and family, or at least are confined to a very limited number of labourers. Not so, however, with the large occupier, holding his 500 or 1,000 acres: a large proportion of the labour of a district must necessarily be dependent for employment on the farm, and when, through want of capital, the farmer is unable to afford the necessary employment, they have no other resource but crime or the workhouse. I apprehend there are very few farmers who, if they were candid enough, would not say—and several of them have told me frankly—that if their farms were half their present size, they would be able to employ nearly as many labourers as they now do upon their larger occupations. "The truth is," said one of the farmers of Norfolk, when speaking to me on the subject, "my capital is not more than enough for 400 acres, and I've got upwards of 800. What's the consequence? I am obliged to stint it, both in manure and in labour, and my case isn't a single one. I'll be bound to say there's many of us that would be glad to give up half their farms if it wasn't for the shame of the thing. They must do it, though, some of 'em, or else go to the wall altogether, depend upon it." The opinions of great numbers of the labourers, who can frequently form a pretty shrewd opinion upon such matters, are similar to that of the farmers just referred to; and, in speaking to many of them on the subject of their employment, they will frequently say, "Master can't afford to do it, d'pend upon it he can't; he has got too many irons in the fire;" or, "Master wants to have as much ground as the squire, but he arnt got the money to work it." I have frequently heard such exclamations as these from the labourers with reference to their employers. Want of capital, therefore, is an evil which applies equally to many of the large as to many of the small farmers, and any argument founded upon it with respect to the one, applies equally to the other.

In many parts of Norfolk and Suffolk the farms are exceedingly large, and in many cases the occupiers do not appear to be suffering from insufficiency of capital—consequently a fair amount of employment is given to the labourer. In Suffolk, Mr. Capon, to whom I have before alluded, farms upwards of 6,000 acres, and is famed for the large number of labourers which he employs. Upon the Culford estate, consisting of upwards of 11,000 acres, there are but eight tenants; and from all I can learn the labourers are well employed and comfortable. In Norfolk the farms, generally speaking, are also very large. Upon the estate of Lord Leicester, consisting of 40,000 acres, I believe there is no farm of less than 500 acres, while many of them are of 1,000 and 1,500, and even 2,500 acres. In order to bring into cultivation this extensive district, it was absolutely necessary that farmers possessed of both capital and skill should be induced to take the farms; and probably the only mode by which this district could have been brought into cultivation, was under the large farm system.

Mr. Baker, who is the steward to the Earl of Leicester, informed me that in his opinion a larger proportion of labour was employed upon large than upon small occupations. He stated that upon a farm of 1,000 acres there would be 16 or 17 labourers employed, while upon the small farm almost the entire amount of the work would be performed by the occupier himself, assisted by members of his family. Mr. Kent, however, who is a most strenuous advocate for the advantages of small farms, stated that in the village of Stanton, in Suffolk, there are several small farmers whose united occupations amounted to about 130 acres, and that these small farms give employment to the occupiers, their sons, and about five labourers. Exclusive of the labourers the employment would be at the rate of about one man to every ten acres. According to this statement the number employed upon the 1,000-acre farms must be enormously below the proportion employed upon the small farms. In many parts of Norfolk there appears to be a growing desire, upon the part of some of the farmers, to increase the size of their occupations. In the neighbourhood of Wymondham and Attleborough, within the last ten or twelve years, all the small farms of 150 to 200 acres have been allowed to merge into one holding, and several of the farmers about there have their 1,000 acres, who formerly held but 400 or 500. An example of this kind might be mentioned in the case of Mr. Howse, who occupies at present four distinct farms, comprising together upwards of 1,000 acres. In order to prevent as much as possible any injury to the labourer, in consequence of non-employment, Lord Wodehouse stipulates with all his tenants that they shall employ a certain amount of labour on their farms. In point of fact, a farmer with 1,000 acres usually employs but very little more labour than is employed upon one of 500 acres, or even less. I was informed of two light land farms—one of 400, the other of 550 acres—on which the average cost of labour per acre was, for the former, £1 8s., for the latter £1 15s.; while in the case of a large light-land farm of 1,650 acres, the cost of labour was only 14s. per acre; upon two others, of 1,400 acres each, it was only 12s.; and in the case of one of 2,400 acres, the average cost was 21s. The average weekly wages upon the two smaller farms were 10s., while upon the farm of 2,400 acres the weekly wages did not exceed 9s. If any dependence is to be placed upon the accuracy of official statistics, it would appear clear that the large farms do not employ a due proportion of labour. The number of agricultural labourers of both sexes, and all ages, in Norfolk, is 41,647; the quantity of land cultivated, including pasture and tillage, has been computed to be 1,045,760 acres, which would give a proportion of about 4·1 labourers to the 100 acres, or 41 to a thousand. The numbers employed upon a farm of 1,000 acres rarely exceed seventeen; taking twenty, however, as the number employed, it would appear that a large farm does not employ more than about one-half its due proportion of labour. The evil which would result from this non-employment of labour upon the large farms appears to be checked in some measure by the increased employment upon the small ones, especially in cases where the small farmers have a sufficiency of capital. There is, however, in many parts of the county, but little surplus labour to be met with. In the Tunstead and Hopping Hundred there have not been for the last five years any able-bodied persons in the workhouse. When I visited it there was but one able-bodied pauper in the house. In the Wangford Union there is generally a larger amount of unemployed labourers than in most other unions. The master of the workhouse there informed me that he had had at one time as many as 396 paupers in the workhouse, of whom 114 were able-bodied. In the week ending Michaelmas, 1849, the number of able-bodied was 43, as compared with 42 in the corresponding period of the last year. The total number of able-bodied paupers in the different unions of Norfolk, in the week ending September 29 of the present year, was 142; the number being 116 at the same period of 1848. The average number of able-bodied receiving indoor relief for the thirteen weeks ending the same period of the present year was 155, as compared with 127 in the corresponding period of 1848. There is, perhaps, no county in England in which machinery is more extensively employed in connection with agriculture than in Norfolk. The slightest improvement in any of the agricultural machines is certain to meet with a cordial reception among the Norfolk farmers. The first thing which would strike a visitor to any of the large model farms which are to be met with in Norfolk, would be the extensive array of agricultural implements of all kinds, many of which, to a novice in such matters, would be alike formidable in appearance and myterious in application. The reader will not expect me to give him an account of the various "clod-crushers," "pulverizers," and "scarifiers" which are in high esteem among the farmers; it is sufficient for my purpose to state that machinery is very extensively employed, and that it is by its constant use that the farmers of Norfolk, many of whom are styled "farmer princes," have attained to their present deservedly elevated position.

Any description of the agriculture of Norfolk, as it affects the condition of the labouring classes, would obviously be incomplete which did not take cognizance of the continued and persevering attempts which have been made to extend the growth of flax in this county; and there is no person, perhaps, to whom the thanks of the community are more due for labours and exertions in this respect than to Mr. Warnes, of Trimingham. For the last eight or ten years he has constantly devoted both his time and his fortune in promoting and bringing to perfection the growth of this useful article. Everything that could be done by public meetings and by pamphlets on the subject, and by the formation of flax-growing associations, has been done by him to bring it prominently before the public, and he has now the satisfaction of witnessing the benefits to the moral and social condition of the people, which have been already caused by the partial growth of flax in the parish in which he resides. As I had heard in travelling through the county a great deal with respect to the growth of flax, and the great employment of labour afforded by it, on the farm of Mr. Warnes, I determined upon visiting it myself, and the results of my visit were such as fully to convince me that neither the benefits of the undertaking nor the exertion of Mr. Warnes had been overstated.

Trimingham, the parish in which Mr. Warnes resides, is a small parish in the North Erpingham hundred, comprising 510 acres. In 1841 its population consisted of 222 persons. It is situated upon the coast, at the extreme north-eastern part of the county, and the soil is, generally speaking, of an inferior character. A portion of the land in Mr. Warnes' occupation is upon the edge of the cliffs, in some cases 200 and in others 300 feet above the level of the sea, and within the last few years three or four acres have fallen into the sea. The condition of the inhabitants was a few years since most deplorable. Typhus fever was seldom absent from the wretched and overcrowded hovels of the poor; the want of decency among the people was almost universal; and the amount of pauperism far exceeded that of the adjoining parishes, owing to the almost entire absence of the means of employment. Since the introduction of flax, however, this state of things has passed away. The poor-rates are merely nominal; there are no paupers in the parish. A commodious school-room has been erected, where previously none had existed; and the cottage accommodation is ample, and of an excellent character. "Previously, little or no employment was provided for the weaker hands; now both old and young find an abundance. The money thus circulated amongst children augments their parents' wages, and thereby large as well as small families derive ample maintenance. The moral and physical state of the village will bear comparison with most. Not an instance of illegitimacy has occurred for many years, nor a conviction for theft. The children, educated at a school unsupported by church or state, are trained to habits of industry through flax-dressing, and early find situations at service." Such is the account of the change which has taken place in this small village, as given in a letter written by Mr. Warnes, a copy of which was recently published in the public papers, and, so far as I was enabled to judge, the benefits have not been in the least exaggerated. Many of the cottages are newly built, and afford ample accommodation to the labourers. Those which have been recently erected are built of rubble and brick, and are mostly thatched; they contain from two to four rooms each. A porch is built in the front of the new cottages, which has the effect of remedying the great inconvenience so universally felt by the poor, of having the doors of their rooms open at once into the street or road. By the use of the two doors, the outer and inner one, the cold draughts of air are prevented from entering, and the rooms are kept cleaner and warmer with a less amount both of labour and fuel. I visited several of the little cottages, and was gratified to see the comfortable state in which most of the tenants were living. The furniture of the rooms was good, and remarkably clean; while on the shelf over the fireplace were to be seen a crowd of such little toys and ornaments as clearly indicate a state of comparative prosperity and contentment among the people. To each of the cottages a small piece of garden ground was attached, varying from an eighth to a quarter of an acre; and at a short distance from the house, and neatly thatched, was a small house, or stye, for the pig. In one of the houses dwelt a man and his wife and six children. The man was by trade a jobbing carpenter, and had for years borne an exceedingly bad character.

Whenever he had it in his power he was almost always drunk; he disliked work, preferring to spend his time at public-houses and beer-shops, where he would collect a few pence by playing on a fiddle. Last winter, as usual, the man, with his family, became an inmate of the workhouse. After he had been there a short time, he obtained a little temporary work; he was discharged, and two of his children resumed their old employment, at flax dressing. "When I had finished my job," said the poor man to me, "I went to the board for an order for re-admission into the house. When I was there I saw Mr. Warnes, and says he to me, 'Why don't you try to get some work?' I said, 'I had tried, but couldn't get none.' Then he said, 'Why don't you come and try to work at the flax along with your children?' and so I went, and after a week or two—I didn't get on very fast at first at the scutching - but I soon got into it, and after a few weeks we *yearned* altogether such a thing as a pound. I sold the fiddle, and we are now all quite comfortable. I have never known what it is to want a meal's victuals since I've been at work at the flax. My children have all got clothes, and we're not put to any of the shifts we used to be. When any of the young uns wanted clean clothes they were always obliged to go to bed and stop there without any on, till they were dried and ready for 'em to put on. It's not so now, for they've all got a change of clothes at least. When I'm not at work a doing of odd jobs in carpentering, there's always something for me to do in the scutching room." This is one instance among many in which the cultivation of flax has been made subservient to the wants of the people, and has removed a load of pauperism which formerly weighed heavily upon the parish. The contrast which the parish of Trimingham presents to many others by which it is surrounded is peculiarly striking in respect to the condition of the labourers. It is the usual custom, I was informed, in a great many of the adjoining parishes, for the farmers to send their teams in order to convey the labourers with their families to the union workhouse for the winter months, and as many as seventy persons have been seen thus to pass through Trimingham on their way to the union workhouse. There is now no able-bodied labourer, nor any portion of his family, in Triminghim, who may not obtain employment throughout the whole of the winter months in scutching and preparing the flax for market. One of the peculiar qualities connected with flax is, that it can be prepared at any time, as it is found that the fibre improves by being stacked after drying and kept for a considerable time. There is, therefore, no necessity for scutching it at any particular season, or within any limited time, and a means of employment is thus afforded for wet or other weather, when field operations are necessarily suspended. On the occasion of my visit, the weather was such as totally to preclude the possibility of carrying on any field labour. The snow had been upon the ground for several days previously—a thaw had set in, and with it a constant and heavy fall of rain; it was one of those days when the country presents one of its most dreary aspects. The men employed upon the farm were not, as in most other instances would have been the case, sent home for want of employment, but on the contrary were all busily engaged in the barn in "beetling" the flax, while upon another portion of the premises fourteen persons, some of whom were children, were employed in scutching it. At the blacksmith's shop close by were standing idly together three or four stout able-bodied men, belonging to a neighbouring farm, who had nothing to do that day on account of the wet, while several others, similarly circumstanced, were intently looking on at the proceedings of those engaged upon the flax. I asked several of them why they were not at work, and they informed me that they had been to the farm, but were told that there was nothing for them to do. I asked them if there was no threshing going on, and was told that there was not then, and that what threshing there was to be done would be done by the regular men. The land occupied by Mr. Warnes does not exceed seventy-five acres, and the number of persons employed upon it is never less than nine men and a boy, while sixteen others are employed in the various processes of preparing the flax for market. The amount paid in wages last winter to the persons employed in preparing the flax was £109 8s. So eager, indeed, are some of the people to get to work, that during last winter they were in the habit of coming at three o'clock in the morning to commence their labours, the work being all paid for by the quantity done.

In addition to the amount of employment which the cultivation of flax affords, it also possesses the additional recommendation of being highly remunerative to the grower. I cannot forbear, while upon the subject, although it may be considered somewhat beyond the natural scope of my inquiry, from referring to a few of the results which have been obtained by Mr. Warnes. He states that, through the cultivation of flax—in connection with fattening cattle with native produce, box-feeding, and summer grazing—three bullocks and three sheep may be fattened where only one of each was kept before, and that the triple quantity of manure thus obtained produces a corresponding increase in the production of the soil. In fact, there is no instance in the whole of the county of Norfolk where so many cattle are fattened upon so small a holding as upon that at Trimingham. He has at present twenty-three bullocks, which are being fattened entirely upon the produce of his farm, made into a compound which entirely supersedes the use of foreign oil-cake. The bullocks are seldom kept in the boxes more than six months; and by the adoption of this plan he is enabled to secure a double return in the year. "The last 23 bullocks," said Mr. Warnes, "which I sold cost me £8 15s. per head; the price at which they were sold was, on an average, £16 5s. They were fed entirely upon linseed and turnips; and I expect to clear as much by those that are now in the boxes. With respect to the flax, the fibre produce of 14 acres was sold last year for £238 16s. 6d.; the value of the seed, at 20 bushels to the acre, and at 6s. per bushel, was £84, and the value of the chaff, which forms a part of the food of the cattle, I estimate at £15—making the total value of the produce of the 14 acres of flax £337 16s. 6d. The sum expended in the preparation of the flax, as wages, was £109; and the rent, seed, and tillage, were £2 11s. per acre, or £35 14s. for the 14 acres, being a total expense of £144 14s., leaving a clear profit upon the 14 acres of £123 2s. 6d.—to say nothing of the value of the manure obtained from the cattle, and the increased fertility obtained thereby upon the other portions of the farm." As showing the enormous amount of additional employment which would be given by the extensive cultivation of flax, Mr. Warnes informed me that the firm of Messrs. Marshall and Co., of Leeds, consume in their manufactory 30 tons of flax in the week, or 1,500 tons per annum, to produce which would require 6,000 acres, and the employment of 2,000 adults or 6,000 children in its preparation. The wages of the adults at 10s. per peek, or of the children at 3s. 4d. per week, would amount to £52,000, being at the rate of £8 13s. 4d. per acre, exclusive of the amount which would be expended for labour upon the culture of the plant. The quantity of flax imported in 1845 was 1,418,323 cwts., the value of which exceeded £5,000,000. Making every possible allowance for the very sanguine opinions which Mr. Warnes entertains of the benefits which would result from an extended growth of flax, it certainly does appear that a large field for additional labour would be opened by its cultivation. "From the most careful calculations," he says, "which I have been able to make upon the subject, founded on my own actual experience, I firmly believe that one acre sown with flax out of every hundred now under tillage, would produce at least 35,000 tons of linseed more than ever were imported of oilcake in one year—afford employment for double the present redundant population—and then not supply half the demand for the fibre." Even though these calculations should prove inaccurate, still if the growth of flax can produce elsewhere results similar to those which I have witnessed at Trimingham, there can be no doubt that the sooner it is cultivated to a greater extent, the sooner will the enormous amount of pauperism decrease, and comfort and contentment be more generally diffused among large masses of the labouring agricultural population.

One of the chief causes which appears to have prevented the extensive growth of flax by the farmers is the opinion very generally entertained that it is of an exhaustive character. Mr. Warnes informs me, however, that when grown in connection with the box feeding of cattle, so far from its being an exhaustive crop, it is entirely the reverse. Last year he had twelve acres of wheat, the greater part of which was sown upon land upon which flax had been grown in the previous year. He states that he never had such fine crops, and that they were superior to any others in the parish. In fact, upon several occasions he has obtained two crops in the year from the same land—one of flax, and one of turnips. The flax ripens earlier than the wheat; and he was last year enabled to pull it in sufficient time to sow the turnips upon the same ground; and many of the turnips which I there saw were of an enormous size, the whole crops being considerably above the average of many other farms which I have visited.

The rents of the farms in Norfolk vary very considerably in different parts of the county. In some parts the arable land is let at rents as high as 50s. per acre, and some of the pasture at upwards of £3. Taking the average of the whole county, the rent of the arable may be taken at 21s. per acre, and that of the marshes at about 30s. per acre. An immense increase has of late years taken place in the rental of the county on some of the marsh land. I was informed that the increase had been as much as from 60 to 80 per cent., and upon some of the good class of soils 30 per cent. According to the returns under the property-tax for 1815, the estimated rental of Norfolk was £1,102,352—the rent per acre 17s., and the estimated profits of occupiers £698,882. The amount assessed under the property-tax was £1,439,977; under the income and property-tax established in 1842 it amounts to £1,945,558, being an increase of 505,581. In the neighbourhood of Wymondham, the farms which form a portion of the property of Lord Wodehouse are let at sums varying from 20s. to 25s. Some of his best lands are let at from 30s. to 50s. per acre. In the parish of Selfield good heavy land, principally clay, is let at from 30s. to 35s. per acre. At Attleborough the rent is about 30s. per acre; the land belonging to Mr. Burroughes, M.P., I was informed, lets at from 30s. to 40s. per acre. Speaking to Mr. Baker, the steward of the Earl of Leicester, on the subject of the rents upon his lordship's estate, he said, "That is a very ticklish subject, but you may fairly set it down at 5s. an acre less than any other of the same kind in Norfolk. Upon some of the light-land farms the rents do not exceed 16s. per acre, in some cases 18s. and 20s.—few exceeding 25s. per acre." The amount of tithe varies very considerably. The rent-charge upon the average is as high, and in some cases higher, than it was some years since, and many of the farmers complain sadly of the bargains which they made under the Tithe Commutation Act. Upon several farms the tithe is as high as 10s. 6d. per acre on the arable land; in other cases 9s., 9s. 6d., 8s., 7s. In two cases out of a list of nearly a hundred which I have seen, the amount is only 1s. 6d. and 1s. 9d. The tithe upon pasture land varies from 1s. 9d. to 3s., the great majority being between 2s. and 3s. the acre.

There is perhaps no subject to which greater attention has been paid by the farmers of Norfolk than to the improvement of their farm-buildings; and the man must be blind indeed who could travel through the county without being struck by their excellent appearance. But not only is it in their external appearance that these great changes have been effected, but in what is indeed far more important—their internal arrangements. In this, as in everything connected with the improvement of the agriculture of Norfolk, are to be found traces of the enterprising spirit and genius of the late Earl of Leicester. The great farm at Holkham is a model worthy to be followed by every agriculturist, and many of the large farmers upon the property have shown a laudable desire to follow the example set them by his lordship. The Holkham great barn and cattle buildings are constructed with a view of obtaining the greatest amount of convenience and accommodation, and also of avoiding the expenditure of unnecessary labour as much as possible. The cattle stalls are all well ventilated, and care is taken to avoid the effects of extreme cold. At Weasenham, upon a farm of Mr. Overman's, I was informed that the buildings were of the most superior character, and afforded an admirable illustration of the great amount of convenience which may be obtained by judicious arrangement upon a comparatively small farm. I cannot omit allusion to the farm-buildings of Sir J. Cullum, Bart., a short distance from Bury. The arrangement of the buildings, and their adaptation to the various purposes required of them, are probably not to be surpassed, if equalled, in the whole of the eastern districts which I have visited.

The improved cultivation of Norfolk has, of necessity, led to the inclosure of a great deal of common lands; and it is computed that there are at present 27,000 acres of uninclosed and waste land which would well repay the cost of inclosure and cultivation. Among these commons might be mentined a large one at Cossey or Costissy, Fakenham, Messingham, Kipton, and numerous others. The inclosure of some of these lands would be attended not only with an increase of production and employment for the labourers, but would also tend vastly to their social and moral improvement. In the neighbourhood of these commons I have almost invariably found the greatest amount of want, wretchedness, and vice among the population. The cases of Barrow, in Suffolk, and Cossey, in Norfolk, afford abundant proofs of this. Speaking of the beneficial results which have attended the inclosure of one of these commons, Mr. Bacon, in his prize essay on the agriculture of Norfolk, refers to the case of a village which was noted, not many years since, for the comparative immorality and want of its inhabitants, and for its large heath and ling grounds, which were in common. The proprietors determined to effect some alteration if possible, and accordingly proceeded to bring part of the common into cultivation. The heath and ling were ploughed in as deeply as the plough would admit of, where they were suffered to decay; the ground was cropped and gradually brought into cultivation; and the result has been that a considerable portion of what was once a barren heath is now studded with farm-buildings and cottages, while the crops are such as to afford ample returns for the outlay of capital and skill. Excellent crops of wheat, barley, and rye were last year produced upon it, and the culture and quality of the turnip crops proved how much had been effected by the personal attention and exertions of the proprietors. The effect upon the village has been, as might have been anticipated, a great reduction of pauperism, and a comparative increase in the comforts of the people themselves. One of the chief evils attending the non-inclosure of these common lands is the great inducement afforded to the building of an inferior class of cottages for the poor people, who flock to such places for the sake of enjoying the rights of the common. The cottages consequently become overcrowded, and the greatest possible amount of wretchedness and vice is to be found in such places. A large quantity of common land has very recently been inclosed in the Hartismere Union, in the county of Suffolk. The interests of the poor are, however, carefully provided for, as a large portion of the inclosed land is set apart for allotments, and four or five acres are reserved as a place of recreation for them. But it is not only the common lands which are being brought under cultivation to a great extent, but large portions of land have been reclaimed, or are in course of reclamation, from the sea. A bill has very recently been obtained, authorizing the reclamation of 32,000 acres on a portion of the Norfolk estuary, between Lynn and Wisbeach, towards the expense of which the corporation of Lynn are to contribute £120,000.

INDIAN CORN—A NEW FOOD.

When the great question of the day and year was, how to feed the Irish in their extremity of hunger, large quantities of the cheapest flour that could be found were imported. Indian meal was brought over from America. The Irish ate it, because they must eat it or starve; and many were the English poor who did the same. The English rich tried it at their tables, with a real anxiety to recognise in it a wholesome and pleasant article of food. How impossible this was found, Mr. Carlyle and others have told the world. Under the best management, under the most careful disguises, the food was found unpalatable. It was sour, or bitter, or musty; sometimes all these.

The reason was this. The moisture contained in the grain is an acid. When the shell of the grain is broken, this moisture forms an oxide, all the sweet qualities of the grain disappear, and a bad flavour is substituted. Whether the meal came over ground, or merely broken, or kiln-dried, before it sailed, the effect was much the same, and people naturally concluded that the mischief was done by bringing the meal over the sea. The case was thus supposed to be hopeless, and the "yellow meal," as the Irish call it, was regarded as a mere refuge, and an odious one, from starvation.

This is now found to be a mistake; and, long as it will probably take to remove an impression so reasonable, it may be worth while to declare that Indian-corn flour may now be had in a perfect state, as wholesome and pleasant as any other flour, and so cheap as to make it an object of serious importance to establish the facts of the case.

A Mr. Stafford, in America, discovered the cause of the mischief, and invented a process by which the acid moisture of the grain is evaporated, without injury to any of its other constituents. The meal is passed over warm cylinders, and comes away almost as incapable of deterioration as sand. It has been shut up in a garret for two years; it has been carried round the world, without losing its sweetness and delicate flavour. This meal can now be sold at two-thirds of the price of the best wheaten flour. With the addition of the cost of carriage into the country, it may be reckoned at less than three-fourths of the price of wheaten flour. Owing to the exertions of the American Minister, and others in London, an extensive trial is in progress there; and here and there, in country districts, a cask has been distributed among neighbours, who immediately become anxious to know how they may obtain the flour regularly. But, as yet, little is done towards introducing it where it is most wanted—among the Irish, who are still lingering on towards the grave; and the Scotch, who are in some parts sinking under the prospect of death by famine. In the island of Skye, the weather was tempestuous last summer. The harvest season was wet; the potatoes failed, as completely as in Ireland in 1847; few of the peasantry have seed corn or potatoes, and those few are daily driven to consume that which is their only hope for another year. A gloom hangs over the bare land, and over the sinking people. On the other side of the sea, the great American valleys are producing a vast surplus of this meal, over and above what the inhabitants can consume, or have, as yet, sold; and in London are the means of communication between those who abound and those who need.

The inventor of the new process has printed instructions and other advice to teach how the Indian-corn flour may be dressed. Our present notice would not be entertaining if it should take the form of an extract from a receipt-book; and we will, therefore, merely say, in regard to the cookery branch of the subject, that the ordinary English taste appears to be best met by a half-and-half mixture of the meal with wheaten flour, or two-thirds of wheaten to one of Indian-flour. We cannot, however, refrain from giving the receipt for the true American pudding, which, though rarely or never described in receipt-books, is exceedingly grateful to the palates of tourists as well as natives:—

Six tablespoonfuls of Indian-corn flour; one pint of milk scalded, with an ounce of butter (or suet); stir in the milk and butter to the flour, and also two tablespoonfuls of molasses, and a very little salt; lemon-peel or citron is an improvement. Tie up in a basin, with a thick cloth, and boil four hours. If baked, it will take two hours. Eat with butter, molasses, or lemon. The flour should always be worked up with boiling water or milk. And, finally, the Americans in England complain of the varying qualities of our yeast, which they declare to be never the same from any two breweries, and therefore difficult to prescribe about in their receipt-books. They are glad when we use the dried German yeast, as giving the experiment of their flour the fairest chance.

Considering how many anxious persons are considering what can best be done for those emaciated Highlanders, who are ready to eat the very seaweed under their feet, if it would only nourish them; considering how many new owners of Irish estates, and old owners of released estates, are pondering, day and night, what can best be done for the peasantry—may we not hope that the opportunity of introducing a fourth or third more good food for the same money will not be overlooked? May not the prevalent disrelish of the "yellow meal" be overcome by an explanation, that the flour under Stafford's patent is not the same article, nor anything like it? Is it not pretty certain that the food which is relished throughout the American navy, and at the tables of gentlemen in London, and tradesmen in country towns, would be well received among those who knew, by personal experience, what dearth is in Scotland, and famine in Ireland? Dare we refuse to try?

Everyone may begin the experiment as he pleases, of course. One was tried in this way. A box arrived at a country town, containing several packages of the flour, done up in weight of seven pounds each. One was sent to the clergyman; one to each inn; one each to three or four houses where good cooks were kept; and, again, to several shopkeepers. Various labourers were asked, as a favour, to accept a hot pudding, or a loaf, and give a perfectly honest account whether they liked it or not. In every case but one the report was favourable. Tradesmen and labourers came to the house to know how they could get more, without running the risk of expensive carriage, by ordering of the flour-dealers. The patron of the experiment sent to London for a cask, out of which, after paying the carriage by luggage-train, the flour will issue at little more than half the present price of wheaten flour in that somewhat expensive little town. As it is by no means the wish of the patron to steal the trade of the baker and flour-dealer, they will come up, bringing their own scales and weights, if they like, and weigh out for themselves; and then, if they please their customers, they can henceforth send their own orders to London. It appears that two or three pounds a year will be saved to the patron's purse by the adoption, to a certain extent, of this new food; and many and many a hard-earned shilling to the labouring man.

More than this—how many shillings may be, not only saved, but brought to the labouring man, if a large importation of American meal should take place! The more food we take from America, the more of our manufactures will the Americans, or somebody else, take in payment for it. We all know how serious have been the alarm and the mischief of the varying and the enhanced price of cotton within the last three years, and how earnestly some capitalists are now setting to work to grow flax in England and Ireland, in order to render us somewhat less dependent on the United States for the staple of our largest manufacture. What a vast amount of risk may be saved if we divide with that country the production of that staple and of food! By such a method, there may be a vast and most moral and politic reduction of the gambling character of our manufactures and commerce, and of that worst of gambling which involves the state of human virtue and human life. Instead of our having all cotton from America, and all food (as regards America) grown at home, let us have some cotton and some food from America, and some flax and some food at home (with cotton from India by-and-by), and our operatives may find their lives equalised, somewhat in the same way that foreign commerce is deprived of much of its gambling character by marine insurance; the illustration, however, being a comparison of small things with great.

There is another view of the matter, not so generally interesting as it should be, but profoundly so to those who understand and appreciate the case. Cotton is grown by slave-labour: Indian corn is grown by the labour of freemen. A great struggle—one of the most serious in principle, and in its certain consequences, whenever they occur, that the human race has ever been engaged in—is now going on, between the slave-power in the Southern States of America, which grow the cotton, and Abolition principles, in the free States in the North, which grow the food. Every increased demand for cotton on our part rivets the chains of the slave: every increased demand for corn on our part strengthens the hands of those who would free the slave. Among the best—the most effectual—friends of the slave, are those who promote the growth of cotton in India, and of flax at home, and who encourage the demand of agricultural produce from the American States north of the Ohio. It is but to few, perhaps, that this plea will be interesting; but to those few the interest will be supreme; for it is they who are aware that, of all the great political questions now stirring in the world, no one involves so many principles important to the welfare of the whole human race, as that of the abolition of slavery in the United States. Every moralist—even every politician—knows that the abolition is certain. It is the time alone that is uncertain: and that time will be hastened—whether little or much—by the extensive use of this humble article—this cheap Indian corn-flour—in our island. —Dicken's Household Words.

FACTS IN THE LAW OF TENANCY.

We extract the following comments upon the above subject from the March number of "Tait's Magazine."

"Mr. Wren Hoskyns, in his evidence (Q. 1005) before the Agricultural Customs Committee, estimates that more than two-thirds of the land of the kingdom are held under settlements, less than one-third being held in fee simple; and both Mr. Hoskyns and Mr. James Stewart, the only two barristers who were examined before the committee, agreed that, as respects all the land, the immediate owner has no power to give the farmer security for the enjoyment of any fixtures he may put up, any buildings he may erect, any drainage, fencing, or grubbing he may do, or any manures he may leave unexhausted in the soil.

"That a tenant has no legal right to any legal compensation for improvements is quite clear. Mr. Stewart's answer to a question from Mr. Pusey upon the subject is as follows: 'I conceive the law to be this: that if the tenant in any way improves the land let to him, either by erecting fixtures or manuring the land, or by any other thing that goes to improve the land, either by that which is temporary in its nature or that which is permanent, I conceive that he has no right by law, on going off the land demised to him, to claim anything from anybody.' Mr. Wingrove Cooke, in his elaborate work upon agricultural tenancies (p. 32), cites the authorities, and states the rule to the same effect. Mr. Wingrove Cooke states the customs in existence in the different counties. In about seven, customs are either formed or forming for giving compensation to an outgoing tenant for unexhausted manures; in all the others some custom exists for giving the outgoer a portion of the corn crop which is upon or in the ground when he quits; but in no one county throughout England is there any established law recognized custom for compensating a tenant for fixtures, buildings, machinery, or even, as it should seem, for fencing and draining. Even where these customs exist, they do not—except the ancient way-going crop custom—attach to the land; that is, they only bind the immediate parties, and do not protect the tenant after his landlord's interest in the land has ceased. Such is the position of the English farmer. He sows, and he hopes to reap; he gathers and he spreads his manure, and he hopes to enjoy the increased fruitfulness of his land; but his trust is not in the law, it is a trembling hope of equity in his landlord. So long as no difference arises about politics or game, so long as the agent is friendly and the landlord's interest continues, all perhaps goes well; but the tenant is never allowed to forget that this is entirely upon suffrance, that at any six months' notice a scrap of paper, with the significant words, "notice to quit," upon it, may strip him of every farthing he has expended upon his farm, and turn him naked upon the world.

"Such is the law, and such is its working! But we shall be told, perhaps, that all this is partial, if not much exaggerated, and that the tenant farmer may be and is covered by his customs, his agreements, and his leases. Nay, but practically, and in very fact, the truth is exactly as we have told it. In Lincolnshire, Yorkshire, Sussex, Suffolk, Kent, and Surrey, there are customs which give a greater or less tenant right, as between the immediate parties to the bargain; but throughout all the rest of the kingdom the custom never goes beyond the wheat crop; and as to leases and agreements, they are in many counties unknown. Where they do exist, they are anything but a security to the tenant. We defy any one to produce to us either a lease or an agreement twenty years (we believe we might say five years) old, which has a single provision for compensation for permanent improvements by the tenant. Of course, we except the tenant-right counties, for there the leases and agreements do usually take notice of such allowances—to contract the operation of the custom.

"It was shown in a previous number of this Magazine, that if the present scale of rents can be supported at all, it can only be by increased produce; and increased produce can only be obtained by 'high farming.' But high farming requires capital and enlightened skill; and as the men who have these requisites are comparatively few in number, they demand *security* for their money and labour, and treat with the landlord upon equal terms.

"Let us suppose a case. 'Good Squire Western,' quoth a new farmer, 'I have perfect confidence in your word; but do you think I can embark a fortune upon your land while the law tells me not only that you might take it all from me in six months, by such a simple formality as a notice to quit, for that of course you would not do; but while the law also tells me that if you should die, or should become insolvent, or should sell this land, which is now only a *caput mortuum*, your next heir, or your assignee, or your purchaser, might, by the like simple process, and in a like short period, take land, drains, buildings, machinery and all, and pay me nothing? This is not to be thought of. Come, what security will you give me? To pay me back my cost, I must have a thirty years' occupation of my buildings, a twenty years' enjoyment of my drainage, at least as much of my new fences; it will take twenty years to pay back the cost of grubbing that unprofitable plantation; and then, when I leave, my fixtures and machinery must be taken at a valuation, and all the manures and tillages of which I have not received the full benefit must be valued to the next incomer, and paid for. Meanwhile the rent must be the rent of an impoverished farm, such as you now see it. When the land has paid for its improvements, it will be yours in its improved state, and we may make a new bargain; but if you turn me out before that time you must pay me in money for the unexpired proportions of the stipulated terms of enjoyment.' *This is tenant-right.* If the squire be one of that third of the squirearchy who have the whole freehold, and can do what they please with the land, he will, after some vain attempts to get better terms, wisely close with the farmer's offer.

"We have been presuming that our squire is the unfettered owner of the soil. But suppose he is a lessee for lives of ecclesiastical or collegiate property. In that case there is no hope for him. He can give no security at all, unless he pays out of the rent an insurance premium upon the lives in his lease. Let us suppose that our squire is the tenant for life of an entailed estate. At his death the land passes to his son (the remainder-man) uncharged and unshackled by anything the father may have done; the farmer is not even a tenant from year to year, not even a tenant at will, but only a tenant on sufferance. Fixtures, drains, fences, buildings, fixed machinery—all pass off at once, with the land, to the remainder-man. Even customs, unless as old as the time of Richard I., will not affect him; and Mr. Wingrove Cooke, who has discussed the subject in all its bearings and with all its authorities, is of opinion that the only custom that could be supported against a remainder-man would be the way-going crop, in the counties where it exists—with, *perhaps*, the tillages and half-tillages of Yorkshire.

"But, lest the reader should hesitate to believe that such can be the law of this civilized country (and the thing is so monstrous that we can well pardon some incredulity), we will state our authority: Mr. Stewart is asked by Mr. Pusey, 'Can you state to the committee whether a contract for remuneration for improvements entered into by a person having a limited estate in the land, contemplating therefore the payment to be made by his successor, would be binding upon that successor, if this special covenant were not supported by the custom of the country in which the farm is situated?' Mr. Stewart answers, 'I conceive that any agreement by a person having a limited estate would have no effect whatever, if such agreement were not supported by a corresponding custom [and he may remark, by parenthesis, that the agreement would have no effect if there were a corresponding custom, because then it would be the custom that would operate, and not the agreement —but Mr. Stewart continues]—I conceive a tenant for life, or a person having such limited interest, except to the extent of his estate, can enter into no contract whatever with any tenant, independent of settlement.' A question is put to Mr. Stewart (p. 14) as to the position of an agricultural tenant who has an agreement for compensation for improvements. The answer is, 'The case I understand to be this: a person being seised in fee-simple enters into a contract with a tenant for restitution of improvements, and he subsequently sells the estate and becomes insolvent [or becomes insolvent and sells the estate], there is no notice to the purchaser of this contract at all; of course the purchaser takes the estate free from the obligation, and the tenant has no remedy, except as far as the assets of the vendor are concerned.'

"We hope we have now fully established, to the conviction of every reader, that the law is as we have stated it to be, and that, of all classes of the community, those who are in immediate subordination to the class which has hitherto made the law are the least protected by the law.

"It would appear scarcely possible that such obvious and startling injustice could continue in our code after its existence had once been pointed out and a remedy suggested. But there is a sturdy tenacity of life in your good old English solecism. Landlords find it much more easy to exhort their farmers to work like freemen than to untie their arms and set them free to work. Committees of the House of Commons have sat and have reported. Twice has that same House sent up to the Lords an innocent and most modest measure, for allowing a tenant for life to give his farmer some modified security against being robbed by his successor. But the Lords, spiritual and temporal, have each time rejected the bill with little ceremony and with small debate; and of all the noble peers who are so disinterestedly passionate in their intreaties to the husbandman to work his capital into the land, we know of no one, Lord Stanley himself not excepted, who found one word to say in favour of giving them any security that that capital should remain their own."

HADDINGTON AGRICULTURAL CLUB.

The monthly meeting of this club was held at the Star Inn, on Friday, 4th current. Mr. Weir (Brownrig) in the chair.

After the usual loyal toasts, the chairman announced the subject for discussion, viz., "The Cultivation of Flax." He knew that Mr. Reid, of Drem, had made experiments in growing flax, and he hoped Mr. Reid would favour the meeting with a statement of these.

Mr. **Reid** said he had grown five imperial acres of flax, after ley, with the purpose of contrasting the returns from it with oats, which occupied the remainder of the field, and the following was his estimate of the expense, and also of the produce of the two crops.

Expense of flax per imperial acre.	£	s.	d.
Ploughing	0	9	0
Harrowing, rolling, and sowing	0	7	0
Cost of seed	2	1	4
Hand-weeding	0	7	1½
Pulling	0	11	8½
Carrying to stackyard	0	3	0
Thrashing and cleaning seed	1	0	0
	£4	19	2

Produce.

18 bushels seed, at 6s.	£5	8	0
32 cwt. straw, at £4 per ton	6	8	0
	11	16	0
Off	4	19	2
	£6	16	10

Expense of oats per imperial acre.

	£	s.	d.
Ploughing, harrowing, and sowing	0	12	6
Seed, 4 bushels, at 2s. 6d.	0	10	0
Shearing	0	8	0
Carrying to stackyard	0	4	0
Thrashing, &c.	0	9	0
	£2	3	6

Produce.

6 qrs., at 18s.	5	8	0
171 stones straw, at 4d.	2	17	0
	8	5	0
Off expenses	2	3	6
	£6	1	6

Leaving the sum of 15s. 4d. in favour of flax. The soil on which this experiment was made may be described as partly strong coarse clay, and partly moss.

Supposing both crops to be grown on better land, Mr. Reid thought the value of flax would be the same, while that of the oats would be increased thus:—

	£	s.	d.
9 qrs. of oats, at 18s.	8	2	0
Straw, as before	2	17	0
	£10	19	0
Off for expenses ..	2	0	6
	£8	18	6

This estimate gives £2 1s. 8d. in favour of an acre of oats over an acre of flax. It is generally estimated that one-third of a ton of prepared flax is a fair return from an acre, although this far exceeds that made by Mr. Taylor, of Carfrae. At £60 per ton for flax, which is the general price for fair quality, there would be from this source a return for the grower of £20 per acre; from which deduct expense of raising as above, £4 19s. 2d., and also of steeping and scutching, as estimated by Mr. Taylor, £2 12s., and there remains £13 8s. 10d. instead of £8 18s. 6d. for oats. From all these experiments and statements, of course, the rent falls to be deducted. Judging from them, Mr. Reid was of opinion that flax could be grown to the greatest advantage in the higher districts, where rent was lower, as soil and climate seemed to have less effect upon it than upon grain crops. Also, if the crop is to be cultivated, that it must be by the farmer raising flax of the finest fibre, and preparing it for the manufacturer, so as to command the highest prices—good management, apparently, having more effect in raising the value of this than any other crop. Unless, therefore, the grower could obtain a higher price for his straw than the sum estimated, he would be inclined in future to confine his exertions to the growing of crops to feed the hungry, in place of those destined to clothe the naked.

Mr. **Christie**, Westbank, saw no reason why a crop of flax should not be improved by being grown on the better descriptions of land, in which case the increased value of the oats, and Mr. Reid's estimate on the contrary supposition, seemed questionable.

Mr. **Cunningham**, Edinburgh, stated that the seed could now be obtained for 30s. in place of £2 1s. 4d., as estimated by Mr. Reid. This made a difference in favour of flax not to be overlooked.

Mr. **Hood**, Loch Houses, had known the produce of flax seed to be 32 bushels per Scots acre, or 25 or 26 bushels the imperial acre, in place of 18 bushels, which Mr. Reid had obtained.

Mr. **Hope**, of Fentonbarns, said that some years ago he had grown about nine imperial acres of flax. He found that it left a very fair profit, after deducting all expenses, at the same time the personal superintendence that it required to get the fibre profitably prepared for the manufacturer was so great, that he would not like again to encounter it. Growing the crop was nothing, neither was the pulling of it, or even the watering or retting on grass the wooden part of the stem; but the breaking and hand-scutching it occupied him fully two years. The way in which this latter part was performed made all the difference betwixt a great profit or a great loss. In order to be successful, a man would require to devote his whole time and energy to it: it was necessary to render it a separate and distinct business from farming. Were establishments on the principle of Schenck's patent process set agoing in the country to furnish a ready market for the straw of the flax, he would have no hesitation in growing flax. He thought Mr. Reid had grown his flax on scarcely the most suitable soil: where he (Mr. Hope) had tried it, part of the field was clay, and part a soft sand, and the flax was best seed of the finest quality on the latter. When they knew that flax varied in price from £50 or £60 a ton up to £150 or £160, it was obvious what different results might be obtained. The importations of flax into this country in a state fit for the manufacturer, in the shape of seed and linseed cake, amounted to upwards of seven millions sterling annually. It was worth considering whether anything could be done to obtain the erection in the county of an apparatus on Schenck's principle; without that he would not grow it himself or recommend it to others. He did not consider flax a scourging crop—its roots were mostly on the surface, and he had had an excellent crop of wheat after it.

Mr. **Shepherd**, Gleghornie, had not yet heard reasons sufficient to convince him of the expediency of again raising flax—a crop that was once extensively cultivated in this country, and given up as unprofitable. It was evident, however, that the members of this club knew very little either of its cultivation or after management.

Mr. **Ainslie**, Dodridge, stated that a friend of his had found wheat after flax inferior to wheat after beans, by about three bolls per acre; not knowing what to do with the straw after he had it, he gave it to cattle, who eat it greedily, and seem to thrive on it (great laughter).

Mr. **Harvey** moved that the club recommend to persons making experiments in the growing of flax to report the same to future meetings of the club.

Mr. **Hope** proposed the health of the chairman, which was drunk with much enthusiasm.

Mr. **Hume** moved the thanks of the club to Mr. Reid, for his experiments in flax growing, and the chairman having given "The land we live in," the meeting separated.

THE AGRICULTURAL DISTRICTS OF ENGLAND.

FROM THE TIMES' COMMISSIONERS.

GAINSBOROUGH, APRIL, 1850.

The reputation in which Lincolnshire is generally held as an agricultural district has naturally led us to examine the circumstances under which the improvements that have been effected there took their origin. On this subject we were reminded, in the first place, that a hundred years ago the county was almost a *terra incognita* when compared with the adjoining districts. Without any important seaport town—without any established manufactures, its land boundaries being impassable fens, desolate heaths, and broad rivers—Lincolnshire has little in its external appearance to attract enterprize and capital to the development of its natural resources. Thus it appears to have remained in a comparatively neglected state till the reign of George III., its now celebrated wolds and heath lands uninclosed wastes, the fee simple of them hardly more valuable than at present their annual rent; the fen and marsh districts a swampy wilderness, scarcely redeemed from the dominion of the waters. When, therefore, some 60 or 70 years ago, the desert state of the county first began to attract attention, and the landowners became fully aware of the hidden wealth which lay beneath the surface of an uncultivated soil, the discovery was accompanied by a portion of that enthusiasm which animates adventurers in other great undertakings, and under the influence of this spirit great things were accomplished. Let us give a few illustrations. In the parish of Limber four tenants became bankrupt while renting 4,000 acres of land, for which they paid 2s. 6d. an acre, or £125 each. The same land is now paying eight or nine times that amount of rent, while the men who raised it to its present value have prospered in the process. Arthur Young expressed his astonishment that the rent of land should have risen on Lincoln-heath, from nothing in most instances, and next to nothing in the rest, up to 10s. an acre, the farmers all the time improving in their circumstances. Yet the same land has, since Young wrote, doubled its value; and at Blankney, where in his time Mr. Chaplin had several thousand acres of warrens, let at from 2s. to 3s. 6d. an acre, the same proprietor has now arable land in an excellent state of cultivation, and bringing 20s. and upwards per acre. By changes like these, carried out upon a great scale, Lincolnshire has undergone a transition from barrenness to fertility more rapid perhaps than any other county in England. Undoubtedly the spirit and enterprize of the principal landowners, seconded by the intelligence and energy of their tenants, have been the chief cause of the change which has been effected. Whatever importance may be attached to other considerations, the personal character of those proprietors who led the way in improvement was the main secret of the success which has attended their efforts. Liberal treatment of tenants, a careful attention to their happiness and comfort, and the confidence created that the fruits of their industry and capital would be secured to them, seem to have been the principles which have actuated the great landholders. In the Yarborough family this policy has been so long maintained as to have assumed a traditional character. With such landlords as Mr. Chaplin the interest which belongs to so noble a spirit is still personal. On the Brocklesby estates farms are held in the hands of the same families for generations, and a distinct and long recognized preference is shown to hereditary claims. When a tenant dies his executors take charge of the farm for the benefit of his son if he happens to be under age; and should the widow marry again the rights of any child by the first marriage are still carefully preserved. Should one member of a family misconduct himself, the next of kin who is a farmer is selected to fill his place, and so the ties of interest, which on other properties alone bind together the owner and occupier of the soil, are here strengthened by that regard for blood and old association which formed so attractive a feature of feudal times. The present Earl of Yarborough, besides continuing and extending that liberal treatment of his tenantry which distinguished his predecessors, has engaged in vast undertakings for developing the resources of Lincolnshire by means of railways and docks. Mr. Chaplin spends his income upon his own estate, and dedicates his best energies to the improvement of the land and the welfare of all who reside on it. His farms are not only moderately rented, but he is always willing to meet the wishes of his tenants with reference to permanent improvements. He has no agent interposed between him and them, and manages everything himself. On the rent day his tenantry dine with him, and throughout the year he lives among them, and freely communicates with them on every subject of mutual interest. He is more a liberal landlord than an indulgent one, carefully distinguishing between good and bad farmers in the distribution of his favours. From the tenants his watchful solicitude extends to the labourers on his estate, and he has built many comfortable cottages, which, with pieces of garden ground attached, are let at a very moderate rent. Though advancing in years he still follows the hounds, and his love of hunting, combined with his qualities as a landlord and magistrate, have brought him to be generally regarded as almost the *beau ideal* of a fine old country gentleman. The influence of such examples among the proprietors of a county it is hardly possible to overestimate. From it has sprung up a very high degree of mutual confidence between the owner and occupier of the soil, which is the more remarkable as it exists without the guarantee of a lease. Lord Yarborough's and Mr. Chaplin's tenants would rather be without leases: yet at the same time they admit that it might be otherwise if they had different landlords. Tenancies from year to year are, however, the general rule in Lincolnshire. They are accompanied by a number of customary allowances to outgoing tenants, calculated to obviate any injurious influences which may arise from the uncertain hold which occupiers thus have over the land. These customary allowances are, in the language of the country, called "tenant right;" and, though some doubts were expressed to us whether the usage was sufficiently certain as to render this "right" a legal one, still in practice it is universally admitted; the landlord acceding to it when a farm comes into his own hands, and refusing to admit an incoming tenant who does not comply with the custom. That custom varies considerably in different part of the county and on different estates. It is also, as will be seen from time to time, extended in its operation as advances are made in the practice of agriculture. The usual allowances in North Lincolnshire, however, include draining, marling, chalking, claying, lime, bones, guano, rape dust, and oil cake. The following is an explanation of the scale on which these allowances are usually made:—

"When the landlord has found tiles, and the tenant has done the labour, if done within 12 months before the end of the tenancy and no crop has been taken from land after the draining thereof is completed, the whole cost is allowed. If one crop has been taken from such land, three-fourths of the cost is allowed, and so on, diminishing the allowance by one-fourth for each crop taken, but this allowance is made only when the work is well and properly done by the tenant to the satisfaction of the landlord or his agent, expressed in writing. For marling or chalking, if done within 12 months before the end of the tenancy, the whole cost is allowed; for that done in the previous year seven-eighths of the cost are allowed; and so on, diminishing the allowance by one-eighth for each year that shall have elapsed since the marling or chalking. For lime used within 12 months before the end of the tenancy, if no crop has been taken from the land limed in that year, the whole cost, including labour, is allowed; if one crop has been taken from such land four-fifths of the cost are allowed; and so on, diminishing the allowance by one-fifth for each crop taken from such land. For claying on light land a similar allowance to that for lime. For bones used within 12 months before the end of the tenancy two-thirds of the cost are allowed, and for those used in the previous year one-third of the cost. For guano and rape dust used within 12 months before the end of tenancy, for turnips or other green crop, two-thirds of the cost are allowed. For oil-cake, given to cattle and sheep, one-third of the cost price of that so used within 12 months before the end of tenancy, and one-sixth of the cost price of that so used in the previous year is allowed."

When the tenant is entitled to a following or way-going crop, it is taken into account in making the foregoing allowances, and the usual payments are also made for acts of husbandry, such as the leading out of manure or other labour for the sole benefit of the landlord or the incoming tenant. The amount of these allowances is generally determined by two arbitrators, and an umpire appointed by them where they cannot agree; they inspect the land to which their arbitration applies, and they also examine evidence for and against the claims put forward. In practice little difficulty is said to arise; and as the award is made, in general terms, of a gross sum withont any particulars furnished, there is no room left for cavil. The arbitrators and their umpire are generally farmers themselves, whose character and experience are believed to fit them for the duty. They receive £2 each per day when engaged in the business of the arbitration, the whole expense of which is from £30 to £50. Whether the evidence received on these occasions for and against claims is always of a satisfactory character may be doubted; and where an outgoing tenant has another farm in his possession, it is acknowledged that a fradulent use may be made of receipts for purchased manures, &c., as proof; but, notwithstanding these obvious drawbacks and disadvantages, the practice, as a whole, is looked upon with great favour by the most intelligent agriculturists of Lincolnshire. The tendency of late arbitrations has been regarded by some landlords and their agents as too much in favour of the outgoing and against the incoming tenant, and some unsuccessful attempts have been made to check this tendency. It has also become not unfrequent for landlords to dispense with the custom of the country by embodying the claims of outgoing tenants in a special agreement. Some difficulties have arisen in consequence of this. When an outgoing tenant is entitled to the way-going or following crop, the incoming tenant's capital is taxed for the rent of the land from which that way-going crop is taken; but this hardship is in some measure rectified when under similar circumstances he quits the farm himself. When, however, the practice as to the allowances to outgoing tenants is made a matter of special agreement in writing, the right to the way-going crop is apt to be overlooked, and we heard of one case where a landlord had very unfairly taken advantage of this omission to deprive his outgoing tenant of his undoubted right to the way-going crop, the price of which he had paid on entering into possession of his farm. Viewed as a whole, the allowances in Lincolnshire to outgoing tenants appear to have worked beneficially for its agricultural interests; but we are far from ascribing to the usage the whole, or even the most considerable portion, of the progress which has been made. It has not led to fraud and roguery, as we found to be the case in Surrey and Sussex, where a usage somewhat similar in principle, but totally different in practice and detail, exists. The Lincolnshire system is a much greater boon to the improving farmer, securing his interests in draining, marling, and other soures of heavy outlay, the benefits of which are still unexhausted when he leaves, and in some important respects being less likely to afford room for imposition. But we have no hesitation in stating, as the result of our enquiries, that moderate rents and perfect confidence on the part of the tenants in the justice of their landlords have had far more to do with the agricultural progress of Lincolnshire than these customary allowances. The farmers with whom we conversed on the subject were entirely of that opinion, and seemed to consider compensation for unexhausted improvements as, however important in itself, secondary to that perfect confidence between a good landlord and a good tenant.

The rate of wages in Lincolnshire is at present 10s. a-week, and labourers are said to be very well off. They, however, often pay high rents for their cottages, being swept out of parishes held by one or two large proprieters, and compelled to live in open parishes at a great distance from their work. In no county yet visited by us have the evil effects resulting from the present law of settlement been more prominently brought before us than here. Labourers, finding six or seven miles of a walk added to their day's labour, frequently ride on donkeys to their work and home again at night. The farmers willingly give accommodation to the donkeys, as they save the men. The system of driving labourers off the large estates appears now to have received a check, and landlords are paying more attention to the building of good cottages and letting them at moderate rents to industrious men. We found in Lincolnshire that some of the farmers board a certain number of their regularly employed farm servants, paying them yearly wages. Others, who do not like to have them in their houses, send them to live with their bailiffs. This last mentioned plan does not seem to work well, and the first also has some disadvantages; but in these times of severe pressure it becomes necessary for the farmer to consider whether it is most economical and best to feed and house as many of his labourers as possible, or to pay them wages and leave them to provide for themselves.

Mansfield, Notts, May.

Leaving the counties which lie along the eastern coast, and entering the midland districts, we now propose to describe the agriculture of Nottinghamshire. Here, for the first time in the course of our survey, we find the mining and manufacturing spirit of the kingdom broadly displayed. The coal formation crops out on the western verge of the county; and the busy town of Nottingham presents a great contrast to the fashionable watering-places and the staid cathedral cities in the southern and eastern divisions of England. We have hitherto been engaged in examining the purely agricultural districts; for where, as in the west of England, a rural population partly manufacturing has been found, the trades at which they work have fallen into decay, and present no counterpoise of interests when compared with those which belong to the soil. But in the midland counties it is very different; there the great manufacturing towns possess the ascendant influence, and the country no longer predominates in the social scale. It will be our duty to show how far the agriculture of the midland counties has adapted itself to the varied wants of the great communities that have grown up in these districts with such extraordinary rapidity, and to what extent the juxtaposition of the producers of food to those of the other necessaries of life has stimulated farming.

The first thing which struck us in the survey of Nottinghamshire was the unusual number of our nobility who have made that county their residence. There is one district here called "the Dukery," from the number of ducal families having seats within it; and though by the sale of Worksop Manor to his Grace of Newcastle, the Duke of Norfolk has withdrawn from the spot, it is still sufficiently remarkable to merit the name it bears. Here are Clumber-park, Welbeck Abbey, Thoresby-park, Rufford-hall, all within the compass of a few miles; the Duke of Newcastle, the Duke of Portland, Earl Manvers, and the Earl of Scarborough occupying one neighbourhood. The county is chiefly in the hands of large proprietors, who exercise great influence within it; who usually let their land from year to year, at moderate rents; and who, as a body, are well spoken of by their tenants. Some of them are enormously wealthy, while others are heavily embarrassed. On encumbered estates rents are higher than on those that are free; and in such cases improvements of a permanent character, such as drainage and farm-buildings, go forward very slowly. But little undue use appears to have been made of the competition for land, even where the pressure upon the landlord has been very great, and the confidence of tenants in the practical security of their tenure has been carefully preserved. With the present crisis in agricultural affairs, however, fresh difficulties arise, which the most experienced do not see their way through if matters are to go on in the old course. It is certain, we are told, that where no arrangement is made to meet the times, rents must fall into arrear. This will necessitate a sale of encumbered estates; thus shaking the existing relations between landlord and tenant on such estates, and probably introducing an entirely new order of things. In the meantime there seems to be a pause, no party knowing what turn matters may take. There have been few abatements of rent made; and in instances where they are most required they can least be afforded. One proprietor only, in the midst of the prevailing doubt, has endeavoured to bridge over the gulf between Protection and Free-trade. Whether he has done so successfully time alone will show; but in the meantime the course which he has taken will be interesting to the public. His Grace the Duke of Portland, as our readers are probably aware, some months ago proposed to his tenants that one-half of their rents should be commuted into a corn-rent; taking 56s. per quarter as the basis. This was to be accompanied by a valuation of his Grace's estates. It seems that the newly-purchased estates were generally let at a rate above the average on the Duke's property, while some of the old estates were let below it. The object of the valuation was therefore to equalize the rents; and, in order to accomplish this, his Grace's tenantry were divided into three classes—the high rented, the fairly rented, and the under rented. To these three classes his Grace's proposition with reference to a corn-rent in part and a valuation were submitted. The two first-mentioned classes accepted the offer made—those paying high rents being lowered 10 per cent. previously; and his Grace, at the last rent-day, intimated to them, through his agent (Mr. Neale), that while he was prepared to adhere to a corn-rent when prices were depressed, however low they fell, he would stop at 64s. per quarter, however high prices rose beyond it. The third class of his Grace's tenants, viz., those who were under rented, preferred remaining as they were to accepting the Duke's proposal; the prospect of a valuation destroying in their eyes any advantage that the change to a corn rent might bring to them. The reduction caused by this modified corn rent is, we are informed, 14 per cent.; and this reduction takes effect retrospectively for the year ending Lady-day last, the Duke's rent being paid six months after it has become due. His Grace's tenants are, we believe, well satisfied with the arrangements thus made; and continue to farm with as much spirit as in more prosperous times. Such are the steps which the Duke of Portland has deemed it necessary to take in the present crisis. His Grace is one of the largest and best landlords in the United Kingdom. For many years he has devoted his energetic mind and great wealth to the improvement of his estates. He was among the first to perceive the advantages of tile drainage, and to carry it out systematically. He did not leave it to his tenants to do it when it was required, nor did he furnish them with tiles, requiring them to find the labour; but he had the whole work efficiently done and paid for himself: he charged a fair interest on his outlay. His investments have nearly always been made with a reproductive view; and the consequence is that the force of circumstances which has swept away protection to agriculture, whatever temporary injury it may inflict elsewhere, will hardly do much damage at Welbeck. The example which the Duke of Portland has set has only been partially followed by the other great proprietors in Nottinghamshire. Tenants have been allowed to hold undisturbed possession of their farms for generations, though occupying from year to year. Their rents have generally been moderate; and when times were prosperous they managed, in some instances, to make money, and as a body to get on pretty well. Where draining is required, however, the Duke of Portland's plan is seldom adopted; the usual practice being that the landlord should find the tiles, and the tenant the labour. Proprietors who are encumbered sometimes refuse to do anything in the shape of permanent improvements; contending that their land is low rented, and that therefore they ought to be relieved from so heavy a tax upon their means. We heard of one instance where the Government Drainage Loan had been taken up in Nottinghamshire. The Duke of Newcastle has availed himself of that measure, and charges interest upon the tenants who receive the benefit of the improvement so effected. As with drainage, so with farm buildings, and in other respects: the work is seldom executed by the landlord entirely and in an efficient and permanent manner; but the farm buildings of North Nottinghamshire are, on the whole, more substantial and better than in most other counties that we have visited. In this division of the county there exist customary allowances to outgoing tenants, similar to those which we found prevailing in Lincolnshire. These allowances, however, we were informed, are more numerous, and made upon a larger scale, and have been longer in operation here. The farmers of North Nottinghamshire attach much value to the tenant right practised among them. It appears, however, to be by no means uniform in its operation, different allowances being made in adjoining estates, and sometimes on adjoining farms. In general, the custom is determined by the award of allowances under which the outgoing tenant himself entered into possession, the rule being that whatever he paid compensation for on entering he shall receive similar compensation for on quitting. For this purpose, tenants carefully preserve the awards of allowances between them and their predecessors, and produce these documents as evidence of what they are entitled to when leaving. Where no award exists, the arbitrators, who are themselves farmers, determine what the allowances should be as best they can, from the rules of the estate in which the land is situated, or from the custom of the surrounding country. They form, in point of fact, a species of equitable tribunal between incoming and outgoing tenants and the landlord, determining the amount of compensation for unexhausted improvements by precedent, if such precedent is to be found; if not, by a fair estimate drawn from the practice of the neighbourhood. Their mode of procedure is, to examine each field, and to contrast any other evidence they may have received with that collected by themselves on a personal inspection. In this way they believe that they arrive at conclusions very near the truth; and as the award is always settled by two payments made at an interval of some months from each other, it is, we are told, seldom that either accidental mistakes or wilful deception remain undiscovered. When an incoming tenant is going to take possession, there are numbers of people about his farm anxious to secure his favour; and if his predecessor has attempted to overreach in the amount of allowances claimed by him, the fact soon reaches the ears of the arbitrators. Formerly, two arbitrators have been considered sufficient to determine all matters in dispute, they having power, in case they could not agree, to appoint an umpire. The landlord seldom interfered, because he regarded his own interest as identical with that of the incoming tenant, and as safe in his hands. Of late, however, this view of the custom appears to have undergone some modification. From the improvements in agriculture, and the greater use of artificial manures and food, the amount of allowances to outgoing tenants has from year to year increased; and it is now becoming more common to have some one present at these arbitrations on the landlord's behalf, to guard him against excessive liabilities. Awards are made much in the same form as in Lincolnshire, no items of charge being given (though the things for which allowances are made are specified), and the whole amount of compensation being set down in one sum at the end. Several attempts have been made by experienced valuers to introduce into their awards a greater amount of precision than at present exists; but when full details were given, parties generally became dissatisfied; and the old system of avoiding figures has, in consequence, been resumed. As in Lincolnshire, the custom with reference to these allowances is extending with the progress of agricultural improvement, each new manure introduced being by degrees admitted within the operation of the practice. There is also this peculiarity in the tenant right of North Nottinghamshire—that buildings erected by the tenant, and not claimed by the landlord as fixtures, are included in the valuations of arbitrators. This is a custom recently introduced, and not, therefore, to be regarded as thoroughly established. Several proprietors have objected to it, but more on special grounds bearing on the individual cases than with reference to the principle involved in such an allowance. We endeavoured to ascertain what, at present, upon an average, valuations of tenant right amount to per acre; but the practice varies so much, that we could obtain no very accurate or satisfactory information on the subject. The general calculation in North Nottinghamshire is that a farmer requires £10 of capital for every acre of land he takes, and that, of that £10, from £4 to £5 will be absorbed by his predecessor's allowances. Throughout the district where tenant right prevails farms are usually from 300 to 500 acres, the soil being for the most part sound turnip land, and sheep being the preponderating stock kept. This district lies chiefly upon the red sandstone formation; and a considerable portion of it was formerly, before the enclosures took place, included in Sherwood Forest. The south-eastern districts of the county consist generally of strong loams and tenacious clays, the farms being seldom above 300 acres in size. The principal tracts in this division are the Trent-bank land and the Vale of Belvoir. The light soils on the northern and western portions of the county are generally very moderately rented. Rents rise in the south-eastern districts, and between Newark and Nottingham they are from 35s. to 60s. and 65s. per acre. The small farmers on the stiff lands are said to be those who suffer most from the present depression of prices. The light land farmers are generally men of capital, and able to stand their ground, for a time at least, against adverse markets. Their occupancies are not so large as in Norfolk and Lincolnshire; but they farm well, and seem perfectly aware that it is not by diminishing their outlay in artificial food and purchased manures that they can hope to meet increased competition. The heavy land farmers, on the other hand, are in a much less favourable position. They require drainage, farm buildings, increased capital, and increased enterprise, before they can be said to be safe. Where all these things are to come from is the difficulty.

Having described the situation of landlords and tenants in Nottinghamshire, we now come to that of the agricultural labourer. The distress which is felt by the upper classes of the landed interest in this county does not as yet appear to have reached him. The rate of wages is about 10s. a week, cottage rents being from £2 10s. to £5 per annum. The great landowners like the Dukes of Portland and Newcastle employ an immense amount of labour about their parks, home farms, and plantations. Labourers so employed receive 2s., and sometimes as much as 4s., per week more than the common rate of wages in the county; but we were told, singular as the statement appears to be, that the labourers thus paid are not unfrequently inferior to those who are earning only 10s. a week in their appearance and domestic comfort. We were much struck by the distance which the men employed in such parks as Clumber and Welbeck have to travel to and from their work. At Clumber, for instance, out of about 50 people employed on the home farm, 30 come every day from the town of Worksop, or the villages of Bothamsall or Elksley—distances of three or four miles, and involving, therefore, an addition to the labourers' daily work of a six or eight miles' walk. Both the Duke of Newcastle and the Duke of Portland have adopted largely the system of garden allotments near towns—a system which appears to be free from the objections urged against allotments to agricultural labourers. These garden allotments are divided from each other by neatly-trimmed hedges, and appear to be cultivated with great care. They supply to the artisan and small tradesman an agreeable method of spending their leisure hours: and while they gratify that longing for country pursuits so commonly felt by a town population, they promote health, and supply fresh vegetables at a cheap rate. The Duke of Newcastle has about 2,000 garden allotments on his estates. The Duke of Portland has also adopted the system, and found it work beneficially. The large proprietors generally throughout Nottinghamshire have hitherto done everything in their power, by diminishing the number of cottages and otherwise, to clear their land of all who were likely at any future time to become paupers. In this way the labouring population has been driven into villages and towns, where they live expensively, and are exposed to additional temptations. The evils resulting from this state of things are much complained of. Ratepayers in the towns complain of being saddled with the support of paupers poured in upon them from the surrounding estates; and farmers are equally annoyed at the distance which their labourers have to travel to and from their work.

On the subject of game, we found that every disposition was felt by the great proprietors not to preserve unduly and to the injury of their tenants. The Duke of Newcastle's head of game had a short time ago increased to such an extent as to induce his tenants to make a representation to him on the subject. His Grace at once directed that steps should be taken to remove this source of annoyance and loss. On the Duke of Portland's estates care is also taken that no serious damage shall be caused to farmers by game; but his grace's woods are very extensive, and more than 20 men are said to be employed about Welbeck in shooting rabbits, and preventing the preserves from becoming overstocked.

TREATISE ON THE CHOICE OF MILCH COWS.

(FROM THE IRISH FARMER'S GAZETTE.)

In our last two numbers we published portions of a translation by "Cultor," of the critique by Professor J. H. Magne, on M. Guénon's "Treatise on the Choice of Milch Cows," since when we have been favoured by W. H. Riall, Esq., with a translation of the original work, which we give precedence to, after which we will continue the critique. We beg to call particular attention to the following important extract from a letter from Mr. Riall, which accompanied the translation :—

> "Having seen a notice in your last publication of a pamphlet styled 'Guénon upon Milch Cows,' I beg leave to forward to you a translation of that work, which I made while in Jersey in the year 1848. I forward also copies of the plates, which are fac-similes of the originals. You state rightly that the work is out of print, as I spared neither trouble nor expense in endeavouring to get a copy of the work, but without success; and I was fortunate to obtain a loan of one from a gentleman who, I understand, got it from the late M. Chateaubriand.
>
> "While in Jersey I have seen the method described tested most fully, and in every case satisfactorily. But it must be remembered that the cows of that island are celebrated for their milking qualities, and are more easily tested than the cows in Ireland, where the breeds are so very much mixed. However, I have come to this conclusion, that although a person may not be able to classify and put into the different orders the various descriptions of cows in this country as easily as could be done in the Channel Islands, yet, after an attentive perusal of M. Guénon's work it will be one's own fault if he ever purchase or keep a bad milker. Another great advantage in the system is, that the signs are developed in young cattle; so that if a person with this work before him placed young stock, which afterwards turn out bad milkers, into his dairy, he will have no one to blame but himself."

DECOUVERTE GUENON, TRACTE DES VACHES LAITIERES.

TREATISE UPON MILCH COWS.

TO KNOW, BY THE SIMPLE INSPECTION OF THE ANIMAL, WHAT QUANTITY OF MILK EACH COW WILL GIVE PER DAY—WHAT THE QUALITY OF THE MILK, AND HOW LONG THE COW WILL MAINTAIN HER MILK AFTER BEING AGAIN IN CALF.

BY FRANCOIS GUENON,

Member of the Agricultural Society of Bordeaux.

Decorated by this society with a Gold Medal, on the 20th of August, 1837, and Corresponding Member of the Central Agricultural Society of Aurillac, Decorated by this Society, 26th of May, 1838, with the Gold Medal, à l'effigie d'Olivier de Serre, Bordeaux, 1838.

Translated by W. H. Riall, 1849.

EXPLANATION OF TERMS.

Gravure.—This term is applied to the hinder part of the animal, commencing at the back of the udder and extending upwards towards the bearing, between the hind legs; it is easily distinguished by the hair growing upwards upon it.

Ecusson.—Literally Escutcheon: is sometimes used in the same sense as Gravure, but always has reference to the hair growing upon the Gravure.

Epis.—Literally an ear of corn, but used to denote a tuft or brush of hair, and sometimes to denote the hair growing on the Gravure.

Contrepoil.—Hair growing the wrong way, or against the grain.

ACCOUNT OF THE DISCOVERY.

In writing the history of my discovery, I must speak of myself. My recital shall be short and succinct, although my labours have been very tedious; but such is the case with almost all discoveries. One will meditate for a long time upon a point which one moment will make apparent.

I am the son of a gardener; for a long time I followed the same calling. I was a great observer of nature; I was always making comparisons, and drawing conclusions from them. For a length of time one idea occupied my mind; it was, that I believed I was destined to make some important discovery in the branch of industry which I pursued. Was this vanity? Whatever it may have been, it took deep root in my mind, and became a fixed idea. In endeavouring to arrive at this desired discovery, I studied the works of the most learned botanists and agriculturists. I learned geometry, also the art of design. I applied myself to all the separate branches of the vegetable kingdom, to know exactly the exterior signs by which to classify the plants and vegetables, and to estimate the value of their qualities and produce, even in their earliest growth. This was doing much, no doubt; but the idea which followed me throughout would not allow me to stop here. I was like Ashaverus, under the hand of the angel; a voice within me was continually crying, "Advance," and it obliged me to do so, and I caught a glimpse of the discovery towards which I was approaching. Chance discovered the famous purple of Tyre; chance offered to my eyes an observation which laid all the foundation of my method.

I was fourteen years of age, and I went, according to the custom of my country, to graze the only cow belonging to to the house. I loved her much, and know her perfectly. One day, as I was amusing myself scratching the bunch which formed the hair, growing the wrong way, or against the grain, on the hinder part of my poor companion, I perceived that a quantity of a kind of bran, or powder, came off. This particularly attracted my attention. I recollected having heard one of my superiors say, that cows should have some exterior signs by which one could know their qualities and their defects, as one can know vegetables by the lines of their skin. This reflection coincided exactly with mine. Reasoning by induction, I arrived at this conclusion, that if, in the vegetable kingdom, there exist some signs which positively indicate the good or bad qualities of plants, there ought also to exist in the animal kingdom some exterior analogous signs, by which one could know the qualities and defects of any animal; and I believed I had discovered one of these signs.

But some conclusions which I might draw from this might still be only a brilliant theory, which experience might contradict. It was, therefore, necessary to appeal to Nature herself. The cow which I had the charge of was good. I sought all around me, in the cows which were near at hand, and which were known to me, if I could find the same signs as in mine. I proceeded to scratch off the powder, which is like bran, the abundance or scarcity of which fixed my attention. I never failed to compare each new cow with mine own. I then decided upon the degree of equality, or superiority, or of inferiority. From that I never ceased to follow my observations. I spared no fatigue. Many times have I gone very many leagues to examine one cow. As I was quite satisfied in my own mind, when having examined an individual cow, the answers to the questions (which I did not fear to heap upon the proprietor) confirmed my judgment. How often have they believed that I must have known previously the cow on which I was passing my judgment! They were quite astonished at the secret, which I took good care not to communicate.

In comparing thus cows with one another, I had occasion to remark that the gravure which produced the powder or kind of bran (which at first was my only guide), varied in their form. From thence new meditations, new reasonings. At length, in 1814, I was convinced that it was from these different signs that one could know the faults and qualities of each animal. From that time my discovery was made; but it should be reduced to a system, particularly to support it by proofs, to pass my own convictions into the minds of others. It was here I had need of all my courage, and all my perseverance. It was not sufficient, indeed, to have discovered the characteristic signs; it was necessary to be assured that the same signs always indicate, in a sure and positive manner, the same faults and the same qualities. To arrive at this, I was obliged to study an immense number of individual animals, to compare them relatively, according to their country, their size, their production. This was not all; it was necessary to classify them. One may imagine what labour this study imposed upon me, a simple child of nature, who never had any idea of a like classification, but which I found myself obliged to establish. This enquiry completely absorbed me. I visited, at great expense, the markets, the fairs, the great cow-houses. I interrogated the cleverest people, agriculturists, cattle dealers, veterinaries. I am convinced my remarks were never found out by any one. Other persons had various ideas of the indications; some fixed upon the shape of the horns; others on that of the udder; others on the shape, or upon the colour of the hair of the animal; others for this or that other reason. In these different motives of appreciation all was vague and uncertain.

I was satisfied in the belief that I had made the important discovery of signs positive. To assure myself more and more of the stability of the principle upon which I was about to found my method, I took care to return to the same places at different times and different seasons, to follow up and remark the variations which nature underwent. I made exact notes of my observations, and I flatter myself I collected a mass of experience, which allows me to give a depth to my reasoning, of consistence to my system, and which, at length, will turn into certainty or full assurance that which at first was with me but probable conjecture.

In 1822 I commenced, upon my own account, the traffic in cows. This profession brought to my view cows of all countries—Swiss, Dutch, British, Poitou, &c.; I could more freely examine the signs of these different breeds. I multiplied my experiences, and again I convinced myself that all the individuals which had the same marks belonged to the same family, whatever might be the soil which had given them birth, and that these marks constantly indicate the same degree of superiority or inferiority; that, in a word, Nature, always like herself, acts at all times, and throughout, in the same manner, and governs herself always by the same laws. During seven or eight years I was occupied without relaxation in putting in order my observations. I established a classification according to the form of the marks; I divided the animals into classes or families, then in each of them I formed a second division, of large size, middle size, and smallest size; at last, each size was again subdivided into orders, following the decrease and malformation of the distinctive marks—immense labour, and which cost me trouble, and care, and loss of time, which can hardly be appreciated, but of which you can form an idea if you will only think of the immense study of nature which I was obliged to undertake; of comparisons, of combinations (I was completely ignorant of scientific studies), to put some order into my system, and to form for myself a clear and precise idea of my discovery. These difficulties, which would probably have disheartened any other person, did not confound me.

In 1828 I proposed to the Academy at Bordeaux to exemplify and verify my system. Nevertheless, I was not then inclined to discover, entirely, my secret, but only to verify the results, and the reality of my discovery. The Academy, without adopting my conclusions, made, nevertheless, honourable mention of me, in its sitting of the 5th of June following, when it expressed itself thus :—

" M. François Guénon de Lebourne, possessor of a method which he believes to be infallible for judging by the simple view of the goodness of milch cows, and of the quantity of milk which each can give, has begged of the Academy to allow him to endeavour to verify, by reiterated proof, the efficacy of his method. It is hard to strike out a way by which to form a judgment upon this subject, of which the possessor reserved to himself the secret. It appeared difficult to admit that the external signs, whatever they might have been, from which M. Guénon formed his judgment, were always proportionably connected with the quantity of milk to be given. The Academy have thought proper to name a committee, charged with examining it.

" The trials have been made with the care and the precautions necessary to prevent any collusion. They took place on three herds of cattle, and have proved that M. Guénon possesses really a great knowledge in this science. However, as long as his method remains a secret it can neither be appreciated nor recompensed by the Academy.

" From these considerations, the Academy being previously assured that M. Guénon consented to submit to all the proofs which might be required, and to make known his method, provided there was offered to him a just recompense in return, has sent him before M. le Prefet, and it was determined to recommend him to the good will of that magistrate, always ready to second that which tends to any improvement."

Things remained in this state; I did not then decide to place the public in my confidence; but I did not the less follow my researches and experiences, to make perfect my discovery.

In 1837 the Agricultural Society of Bordeaux wished to convince themselves of the reality of my system: the result surprised the expectations of the society; and the trials that were made, before the committee appointed for the purpose, left no further doubt about the truth of my method. See in what terms the committee expresses itself in its report—

" AGRICULTURAL COMMITTEE OF BORDEAUX.

" DECOUVERTE GUENON (MILCH COWS).

" *Report to the Agricultural Society of Bordeaux.*

" MESSIEURS,—The committee which you have appointed for the purpose of examining into the discoveries of M. F. Guénon, of Lisbourne, have the honour to submit the result of their observations.

" M. F. G. has established a method, by means of which one can easily know and classify the different kinds of milch cows—1st, as to the quantity of milk they will give each day; 2nd, the longest and shortest time they will hold their milk; and, 3rd, the quality of the milk.

" Up to this time the authors and professors who have occupied their attention upon this subject have pointed out but very vague marks for appreciating the qualities of cows, more or less adapted for the secretion of milk. After more than twenty years' experience M. Guénon has been enabled to discover natural and positive signs, which serve as the base of his method henceforth, secure from all error.

" Understanding that your committee must be plainly convinced, and that it would not receive, except with a certain distrust, all appreciations which (in the examination that he proposed to make before it) would not rest on positive facts, M. Guénon has shown at once, and without any restriction, the positive signs upon which he has established his method. With the help of these signs, always exterior and apparent, he has formed eight classes or families, which embrace cows from every part of the country. Each of these classes or families is divided into three sections, comprising cows of the largest size, middle size, and smallest size; which sections are subdivided into eight orders each.

" With the assistance of this classification—clear and simple—any person may know easily, amongst a group or herd of those cows—

" 1st. Those that are capable of giving twenty-four quarts of milk per day, and to know exactly the diminution of each; from those that produce nothing, or almost nothing.

" 2nd. To appreciate the qualities of the milk, whether it will be buttery, or thin and watery.

" 3rd. To know how long the cow will hold her milk when again in calf.

" This method—so valuable in whatever way you may wish to apply it, whether as to the produce of milk only, or as serving to improve the breed (as the want of attention in breeding only tends to degenerate more and more)—becomes of the highest interest when you consider that it applies at once to grown animals and to calves of three months old. Thus, upon the one part, it affords the means of surely judging of the subjects or animals which have reached their developments, of which you have often great hopes, from their breed and symmetry, but nevertheless whose produce of milk will never be abundant. On the other hand, it secures the offspring, in warning you to put away at once the calves which will never indemnify you for the trouble and expense of their rearing. Should these results, hitherto looked for in vain, be found out by experience? This is what your committee has to prove. The method of M. Guénon being made known to them, they were anxious to assure themselves as to what point, or how far, the essential signs which constitute the method, ought or could receive a rigorous application. Consequently, they visited many farms situated in different localities, for the purpose of examining and deciding upon the different breeds which did not always present the same characteristics.

"They think it right to enter into some details of the manner of proceeding which they followed, persuaded that you could by these means better apprehend the merit of the method; and that you will be better able to judge with certainty as to the interest and patronage which you should give to a discovery, which the author submits to you with so much more confidence, because it relates directly to agricultural interests.

"The cows submitted for examination were taken separately. One of the members of the committee wrote down the words of M. Guénon, and immediately after addressed to the owners of the cows (who had been kept quite separate) questions which might either confirm or condemn the judgment given. It is thus that we have examined with the greatest care; and in taking note of the observations made upon all the animals (more than sixty cows and calves), we must declare that the indications given upon each of them, whether as to the quantity of milk, or the time they will give it after being again in calf, or upon the quality, whether more or less buttery or watery, have always been found correct—merely some slight difference in appraising the quantity of the milk; the reason being, as we feel convinced, the difference of food given to the animal, it being either more or less abundant or rich.

"The first trial seemed already from its results, more than conclusive, when a fresh instance of its success appeared on a second examination, by the presence of M. Guénon's brother. Your committee, taking advantage of this circumstance, caused the cows to be examined by both brothers—but separately; for one having given his opinion, founded upon the system which is common to both, the other, who was studiously kept separate, was called in his turn, and, in the absence of his brother, gave his judgment upon the same beast. This manner of proceeding should necessarily lead to some differences and contradictions in the appraising of the cows submitted for their examination, if their method happened not to be positive and certain.

"Well, gentlemen, we must declare that this last experiment has been decisive; for we have had it proved, that not only were the indications given by the Brothers Guénon perfectly alike, but they also agreed with the declarations of the owners of the cows, relatively as to all the good qualities or all the defects of the animal submitted for examination.

"As far as regards the owners of the cows, and the other persons present, these trials were considered of so much more surprising a nature, because they were so equally performed, and because the results were so certain. However, it was easy to perceive that they had little confidence in the discovery, because they did not understand it, and that they attributed the knowledge of M. Guénon merely to his great experience in his observations on cows.

"As far as regards us, to whom the method used was no longer a secret (as we have already said), it is with an interest and an astonishment always increasing that we proceed with these examinations, often repeated and always exact.

"Two members particularly of your committee, who from their especial studies, and their physiological knowledge of the domestic animals, are particularly remarkable, have, from the first, felt all the force and all the truth of the system, the fortunate applications of which have been multiplied under our eyes.

"This system, gentlemen, we fear not to pronounce 'infallible;' the signs which constitute it, always certain, never changing in the position which they occupy, are strongly imprinted upon the animal by nature.

"To appreciate them becomes easy, since it only requires, after having examined them, to find out upon the plate, designed for the purpose, the corresponding signs, to which there is added an explanation, short, but precise, which forms a certain rule for finding out the good or bad qualities of the animal, at the same time that it points out the class and order to which it must naturally belong.

"It is in thus examining the signs, so natural and so positive upon the animal, and their representation, faithfully pourtrayed on the plate of explanation, that immediately, from the first experience, the members of your committee themselves have been able to apply the method, which, as in the case of M. Guénon, has been found justified by the facts.

(Signed) "GUICHENET, Veterinary of the Department of the Dordogone.
"LE COMTE.
"F. PELISSIER."

And it is followed by resolutions, afterwards unanimously adopted by the Agricultural Society, at its general sitting, at the hotel of Prefecteur, July 4, 1837—

"The society, having heard the report of the committee, decree to M. F. Guénon—

"1st. A gold medal.

"2nd. Subscribers for fifty copies of his work on 'Milch Cows.'

"3rd. Proclaims him member of the Agricultural Society.

"4th. Orders that 1,000 copies of the report of the committee be printed, to be distributed amongst the different societies of France.

"Resolved in general assembly, at the Hotel of the Prefecteur, July 4, 1837.

"The Secretary General of the Society,
(Signed) "RICHLIER."

At a general meeting of the Agricultural Society of Aurillac, held on the 26th of May, 1838, this society also renders an account, an extract of which report I proceed to give of the trials I was called upon to make before them :—

"*Report of the Central Society of Agriculture of Cantal.*

"Yesterday, 25th May, 1838, M. Guénon arrived at Aurillac. He accompamied the members of your committee to the farm of Veyrac, belonging to the president of your society; he examined with the most scrupulous attention the fine dairy of cows of this domain, which is composed of one hundred milch cows, of the best kinds in the country. He commenced his trials upon a number of cows that were presented to him, and which had been chosen purposely from amongst the best, the middling, and the worst milchers. M. Guénon gave, upon each of them, separately, precise indications as to the quantity of milk each would give per diem, and the length of time they would hold their milk after being again in calf.

"We must avow to you, gentlemen, that they have, almost in every instance, agreed with the declarations of the owners of the cows. We have only had to mark some slight differences in the appraising of the quality of the milk. Upon this subject, we must observe that the cows on this property are always well fed with clover, or with other artificial food, which increases considerably the quantity of milk, and which might cause the error of M. Guénon, who foretold a produce of milk a little inferior to that which the cows really have, and who was entirely ignorant of the manner in which the cows of this country are nourished.

"At length, to entirely convince your committee of the truth of this discovery, M. Guénon made known the different signs upon which he has established his method. By means of these signs, which are exterior, and apparent, and traced by nature upon all the animals, he has formed eight classes, or families, that comprise cows taken from all the provinces; each class he has divided into eight orders, which he has again subdivided into three sections, that comprise cows of the largest, middle, and smallest size.

"From numberless observations, the author has found all cows to belong to one of these classes or families, as also to one of the orders mentioned. Each class possesses some different marks in form and size, that are very easily distinguished by simple inspection. Accordingly, cows of the first orders of each class are the best, and their produce of milk is always proportionate to the order; so that the two first are the most productive, the third and fourth passably good, and the others the worst, in proportion. M. Guénon has informed us that his system applies equally well to young animals, and that you can judge with certainty their qualities for the production of milk—in fact, he has shown us the same signs on bulls kept for breeding, and upon young calves of three and four months old. The owners of the cows have declared the young heifers that have been classed in the first orders, to be the offspring of mothers which gave a great quantity of milk. Two superb bulls, of the fine breed of Salers, of equal age, and alike in colour of hair and size, were judged of in a very different manner—one was good, and classed in the first order of the class Flandrines; and the other bad, in the fifth order of the class Carresines.

"This day, 26th May, M. Guénon made fresh experiments, at the market-place of the town of Aurillac, in presence of very many members of the Central Society of Agriculture and of a great number of proprietors and cultivators of Cantal and of the neighbouring departments. The following is the manner in which your committee thought it right to proceed:—Each cow was examined separately by M. Guénon, who wrote his notes upon a paper, which was folded, and handed to one of us. Immediately after the examination, another member of your committee addressed to the proprietor or to the person who had charge of the cow certain questions relative to the quantity and quality of the milk that the animal gave each day, and how long she maintained her milk after being again in calf. This declaration was compared with that given by M. Guénon. In general his declarations agreed with those of the proprietors, and have proved to the members of your committee, and to every person present, that M. Guénon possesses great ability in discerning the qualities of the animals, and that his system is founded on certain basis. A particular fact has still more confirmed us in this opinion :—A spiteful farmer caused him to examine a second time a cow that he had already passed his judgment upon and classified. The last declaration of M. Guénon agreed perfectly in every respect with that which he had previously written.

* * * * * *

"Your committee has the honour to propose to you—

"1st. To decree to M. Guénon a gold medal, à l'effigie d'Olivier de Serres, as an encouragement.

"2nd. To proclaim him a corresponding member of the society.

"3rd. To subscribe to twenty-five impressions of his work, which shall be distributed to all the agricultural societies of the department.

"4th. To insert the present report in the 'Propagateur Agricole,' and to send a copy of it to all the prefets and to the different agricultural societies of France.

(Signed) "Le Conte de Soignes,
"G. De La Laubie,
"Le General Baron Higonet,
"V. De Precines, Secretary to the Committee."*

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* After these testimonies, so honourable to me, I proceed to publish that which I have prepared in silence and with much labour. Any person can, with the help of the plates, attached to this work, easily know the distinctive marks of each animal; they are visible on every cow, on the hinder part, between the udder and the bearing.

There are kinds of ecussons of different forms and size, formed by the hair growing the contrary way, or against the grain—sometimes vertically, sometimes transversal—of which the varieties show the class and order to which the individual belongs.

OF COWS IN GENERAL.

Although all naturalists and farmers agree as to the influence which the good qualities or defects of the male and female exercise upon the offspring, it is an essential point, which is too much neglected in the country. They pay little attention to keeping the breeds pure—still less to improving them. They cross, at all hazards, a bull of one class with a cow of another; which, although of the same breed, causes the offspring to fall into a new class still different. However, my experience teaches me that a bull of the largest size, given to a cow of the smallest size, will produce a cross stronger than the mother; but, on the contrary, a good cow given to a bad bull will always produce an offspring inferior to the mother. A bull of the first order, of whatever class it may be, given to an inferior cow, will produce an offspring superior to the mother, and consequently it will always be much better if in each class you bring together beasts of the first order; but if, on the contrary, you ally or bring together beasts of different orders and different classes, an offspring will be the consequence that will belong neither to the class of the father nor of the mother, but will fall into another class and another order, which no one could know but by the characteristic signs, which must be laid down, and which I shall point out directly. Each class has its bastards—that is to say, individuals which, although resembling the original classes, differ very much in their produce of milk. This resemblance is a continual source of error; and I shall point out the signs by which the bastard race can be known.

It is, then, very essential not to give cows except to bulls of good quality. The marks upon the bulls are the same as with the cows; but these marks are more contracted on the bulls.

My remarks rest upon exterior signs, apparent in all. The signs are altogether independent of the colour of the hair, which is not of the slightest consequence in classifying; and which, at the very most, can only be indicative as to what country the animal may belong. Their qualities differ, not in consequence of the skin, but from the characteristic signs of which I have already spoken.

The deterioration of the breeds must be, in some degree, attributed to the influence of climate; for although, generally speaking, the bad kinds are much more frequently met with than the good, there are nevertheless countries where the latter abound more. So, cold countries agree better with cows of all kinds, and all classes. The cows of Flanders, Holland, England, and Scotland excel those of France, and much more those of Spain, in the quantity and quality of their milk; but everywhere, and always, the two first orders are the best, and from which you ought to breed, in order to obtain the most abundant produce of milk. It must, however, be acknowledged, that even in the most favoured countries you will always find the inferior kinds. To diminish the number, and to improve as much as possible even the best kinds, should be the constant aim and only look-out of the breeder and farmer. Farmers and agriculturists cannot pretend to change the nature of the climate, but they can avoid the crossings which deteriorate the breeds. How many farmers, even to-day, keep, or have kept for many years, heifers, whose produce of milk they expected would have indemnified them for their care and expense, when after long waiting, they see all their hopes vanish, and find a considerable loss where they hoped to have found a little treasure? How many others have placed in the hands of the butcher the young heifer which would have amply recompensed them for their trouble and care; whilst, by a little attention and experience they could have known the former, which in reality gave them hardly any produce, and whose offspring must prove of an inferior kind? This is one of the disappointments which we would desire to avert from those who are breeders of cattle, by giving them a sure means of knowing, even amongst the youngest calves, those from which you have nothing to expect, and those from which you can expect, with confidence, a rich and abundant milk.

Hitherto, agriculturists only paid attention, in the breeding of cattle, to the shape, size, deportment, or breed. The result of this system must always be doubtful, and which must necessarily lead to a deterioration of the race. The signs or marks are often deceptive; and to those who doubt it we shall say, allow us to make comparison between our race and that of cattle. How many men and women are there of the finest make, upon whom it is delightful to look, to whom Nature has refused the power to increase their race? How many children are born from robust parents, pitiful, without vigour, without any apparent strength? How many are born with a dull and backward spirit, of parents who are far from these faults—who were even remarkable for the subtilty of their imagination? There are cows which have the finest appearance in their strength, size, skin—nothing apparently wanting to make them perfect but they give none or very little milk; and even that is watery and thin.

All cows should have their hair short; the head short and square; the eyes large; the udder slightly falling (*allongi*), round, and covered with a little downy hair; the rump high. In general, cows which have four teats, equal in size, are the best. However, those which have six, of which four are equal, and two others less long (these latter in general give no milk), are also very good, and abundant in produce of milk.

I have remarked that in the inferior orders, cows have often four teats and a small nipple, but that these teats are always unequal, and that the udder is also very often covered, not with a down, but with a coarse and thin hair. I give the name *ecusson* or *gravure* to the marks or signs by which I distinguish the cows of each class.

This ecusson or gravure is distinguished by the hair, of which one part, throwing itself out from the middle of the four teats at the centre, extends itself under the belly in the direction of the navel; whilst the other part, growing up a little above the houghs and flowing over upon the thighs, rises behind and extends itself up to the bearing, in certain classes. The epis (literally an ear of corn, but here a beard of hair, or tuft of hair, formed by the hair growing the wrong way on the right and left of the bearing) have their own properties; they correspond with the hollow or reservoir of milk, placed in the interior of the beast, and which is always in exact accordance with these epis. If the ecusson or gravure be large, the reservoir of milk will be large, and, consequently, the produce abundant; and, on the contrary, if small, the reservoir will be small.

According to their width and length, these epis, which are unequal, indicate the bastard cows in each class and in each order; in short, if they are too wide, they cause the loss of milk when the cow is again in calf, and more or less rapidly in proportion to the size. The longest epis indicate the most rapid loss of milk. The finest epis, composed of a hair short and silky, are the best; the epis of a coarse hair, stiff or bristling, are the worst, for they either indicate a great loss of milk or a milk watery and thin. We may say, then, that the cows whose gravure or ecusson is formed of the finest hair are the best, particularly if they have, from the inside of the thighs up to the bearing, the skin of a yellowish colour, and if the kind of bran or powder which comes off this skin be of the same colour. The cows in which these marks extend themselves to the bunch at the end of the tail, and whence falls a yellow powder or bran, will give very rich and buttery milk, whatever quantity they may give each day, and to whatever class or order they may belong. All cows whose skin is smooth and white, whose udders are covered with thin hair, and the hair which grows the wrong way on the epis of the gravure forming a long ecusson, will always give a watery and poor milk. The cows which have their udders covered with a hair short and furry, and fine in the epis of the hair, growing the wrong way in the ecusson, will give rich and good milk. These marks or ecusson are subject to some little variations in their size, colour, or produce.

When the gravure, which is well marked on each cow, shall belong to the first or second order, of whatsoever class it may be—and that, nevertheless, there shall be a barrenness of hair growing upwards, replaced by hair descending—the cow will be degenerated to the extent of one, or even two orders, according to the size of the barrenness of hair growing up, which the gravure will show. When the gravure shall be wider above than below, it causes degeneration to the extent of one order.

All the defects of gravure which are found on the right and left of the thighs, or bearing, indicate always a scarcity of milk, according to the size; because, as I said before, the epis thus placed correspond with the reservoir of the milk within—the scarcity or barrenness of hair growing up. The deformities which are found in these epis denote analogous defects in the lactiferous vessels.

These same defects or barrenness of hair correspond also with the lactiferous vessels which are below and on each side of the belly of the cow, passing nearly to the height of the navel, according to the order. These vessels terminate in a small hole, into which you can place the top of your finger. In the cows of the first orders of each class these vessels or veins are tortuous or varicose; proceeding from the udder they form a fork, one greater and the other less, and both terminate from three to four inches apart: the hole of the second is smaller and less deep than the first, which I call *maître vaisseau*. In the inferior orders you will find these vessels to be straight, and that the hole where they terminate is smaller and less deep, according as the cow is, or may be, of a more inferior order.

In general, then, there is a barrenness, such as I have described, in the ecusson on the right and left of the thighs; it corresponds with the lactiferous vessels which are found below the belly. It is easy to convince one of this relation between these two parts of the animals, by one feeling the vessels or veins; for you will always find that upon the side where there is the default or barrenness in the ecusson, the lactiferous vessel is smaller, and the hole where it terminates smaller and less deep than on the side where there is no barrenness or default.

All the cows of the first orders of each class, which have the gravure well characterized, will have the quantity of milk which I shall by-and-by point out. But those which will show a defect in the contrepoil of the gravure, whatever way be its direction, or of hair growing down amidst that which grows upwards, all these cows defective in the gravure show a degeneration and a default of produce of milk. This shall be more fully explained.

In speaking of each class in particular and of the bastards which belong to them, I shall make every effort to explan as fully as possible in theory, for I regard these principles as of the highest importance.

When the cows are far advanced in calf, a few days before calving, and particularly at the moment of calving, the epis formed by the contrepoil enlarge themselves everywhere, as a flower which is going to blow. Then the beast being ready to calve, the lactiferous vessels distend and dispose themselves to give the greatest force of milk in the first days of calving; but a few days after, the epis of the contrepoil contracts itself as before. It will be remarked that the epis of bristling hair, at the time of calving, are then of an extraordinary size or width, both those on the right and left of the thighs, as well as those on the right and left of the bearing; but a few days after calving they contract about one-third. To judge of the quantity of milk which a cow ought to give, one must not judge by the produce of the first few days after calving; for, in the first orders, there may be a natural inflammation of the lactiferous vessels, which may be greater in one cow than in another, and which may impede the flow of milk; while in the inferior orders a great number of cows, which are in flesh, instead of having much milk in a large udder have often only a mass of proud flesh, which absorbs the milk, the place of which it fills up. The presence of this flesh internally can easily be known by the contrepoil on the right and left of the bearing. These epis, as I have said, show, according to their form and size, the abundance or the scarcity of milk in each class and each order.

The distinctive marks in the cows or the heifers, in good order, are much more apparent and developed than in those which are thin and in bad condition, when the characteristic signs are more contracted; nevertheless, whatever may be the bad condition, the signs are always visible and easy to be distinguished.

All the amateurs and possessors of cows who would know the classification which I have established, must follow the degrees as I have done, remarking that in classifying it is necessary to seek out the proportion of the size of the cow —that is to say, if by its make it is applicable to the largest, middling, or smallest size. Attending to this proportion, the produce will be known, and no error will be committed; for whatever may be the order of the animal, the signs being always those of the original class, one will see by those signs to what order it belongs, and then one will know exactly the produce it will give, just as if you had seen her proved for some months.

I have said that when copulation takes place between subjects of different classes and different orders, there will be a cross which belongs neither to the class of the father nor of the mother. It happens, then, that the characteristic signs of the cross differ from those of the parents, and are cast into another class. To understand exactly in what category one ought to place them, you must assist the classification in seeking out the gravure or ecusson, which, by its resemblance, approaches nearest. Should you not find it sufficiently clearly characterized, you must place it in the first order, but always in the class to which it has most resemblance. By this means one knows, with a slight difference, what produce the cow gives or will give each day, the time she will maintain her full milking, and the diminution when again in calf. Cows on good pasture will of course give much more milk proportionally to their class and order than those on poor ground.

Cows which calve in a good season (spring) will give more milk than those which calve in winter.

From the first to the last order, I have stated the produce rather below the mark—that is, if the cattle be well fed and attended to. It is necessary to feed cows well while they are in full milk, and to begin to stint them in feeding when the milk begins to decrease, and when they are advanced in calf. They should be milked twice a day, at regular hours, and drawn dry each time. Cows of the first and second order of each class should be milked three times a day when they have first calved. The dairywomen and those who have charge of the cows must take great care not to give too much food, because of the stoppage which it might occasion to the milk—a stoppage which often causes the loss of both cow and calf. This comes from the inflammatory obstruction which takes place in the udder, and the pain in all the lactiferous vessels. The hair growing the wrong way, which forms the ecusson or gravure, which indicates the class and order, distends itself, and grows large some days before and after the moment of calving. It is necessary, then, that for the first few days the cows should be well cared for, and should get nothing but light food. Five or six days afterwards they may get their natural food without any risk; because then the course of the milk will be fixed and determined, and the milk-vessels well dilated. Cows of the inferior orders are exempt from all these kinds of maladies.

When you would rear calves to replace the old cows, you must choose a bull which will agree with the best cow you can find of the same class and order, as nearly as possible; then you will produce a good breed, whose produce will invariably accord with that of the parents. For the preservation of the cows, it is necessary not to neglect to lead them to the bull when they are in season, because, when they have passed their season two or three times without being bulled, they are subject not to hold the bull; then you lose good cows, the milk of which is gone, and they are only fit for the butcher.

SOME PARTICULAR DESCRIPTIONS OF COWS.

I have said that I have established a classification, and you may imagine what time it has taken to form it; for I do not write a natural history, but the result of my personal observation and experience. I have only followed the progress of my discovery; and as order was formed in my mind, I proceeded. I gave new names which accorded with my ideas, and which would designate the figures or shapes of the ecussons of each class. I have divided the cows into eight grand classes or families, each of which is composed of eight orders and three degrees of size. All cows, whatever they may be, will be found in one of these classes and in one of these orders. Each class gives a certain quantity of milk, according to the order and size. It possesses its peculiar mark or ecusson, which will be known in all the orders, with the modifications, according to the degree to which the animal belongs.

I call the cows of my

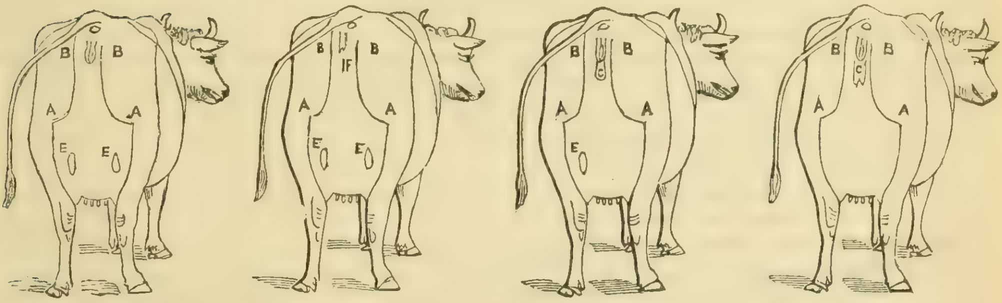
First class	Flandrines
Second class	Lessiére
Third class	Courbelines
Fourth class	Bicornes
Fifth class	Poitevines
Sixth class..........	Equerrines
Seventh class........	Limousines
Eighth class	Carrésines.

With the aid of the plates of which I have spoken, amateurs and breeders can, at the first glance, know to what class and to what order such or such an animal belongs, and, consequently, to judge exactly what produce it will give each day, and the the time such cow will hold its full milking. The quantity will vary sometimes, because, as I have stated, the climate, the feeding, and the season of calving must exercise an influence more or less favourable. But what can never vary—that which is always certain—is, that everywhere, and at all times, the cows of the first orders of each class are always the best and the most abundant in milk, and that all the other orders follow in the same proportion; so that the produce of the cow of the eighth order must be regarded as almost nothing.

You will find bastard cows in all the classes. They resemble individuals of the same classes, sometimes so nearly that the difference is very trifling, but still it will always be discernible to the eye.

The bastard cows have this peculiarity—that they give milk until again in calf; but when arrived at that state, they lose their milk immediately, or, at least, a very few days afterwards. Sometimes they are great milkers when first calved; sometimes, on the contrary, they have great appearance of milk, but give a miserable quantity and quality. When the quantity is great, the quality is wretched; and, on the contrary, when the quality is good, the quantity is almost nothing.

FIRST CLASS—FLANDRINES COW—LARGEST SIZE.



FIRST ORDER.—NO. I. SECOND ORDER.—NO. II. THIRD ORDER.—NO. III. FOURTH ORDER.—NO. IV.

EXPLANATION OF THE PLATES.

FLANDRINES COWS.

FIRST CLASS.

The names which I have given to my classes are purely arbitrary, and answer simply to my ideas. I have given to the cows of my first class the name of Flandrines, because the cows of that class are the best in our provinces, and that the race of cows of Flanders, known generally by their good qualities, possess the characteristic signs (usually, at least,) which distinguish this first class. These cows, which I call Flandrines, are the most productive and the most abundant in milk, but they are the most rare in our provinces. Each order of this class, as in all the others, allows of some particular differences in the general mark of its class, and will give a different product in all the degrees, as I shall explain. I call cows of the largest size those which weigh from 7 cwt. upwards; of the middle size, from 4 to 7 cwt.; and those of the smallest size, under 4 cwt.

LARGEST SIZE.

FIRST ORDER.—NO. I.

The cows of the first order of this class, and of this size, give, in their full milking, about twenty-four quarts per day—that is, until they are again in calf. From that time the quantity of their milk will diminish very gradually, but they will maintain their milk until they have gone eight months in calf; in fact, the cows of this class, and of this order, never run dry, if they are always regularly drawn or milked. You can recognize cows of this class, and of this order, by their fine udder, covered with very small hair or down, which grows upwards from the middle of the four teats, all over the hinder parts of the udder, within and above the two hams and the thighs, stretching out to the right and to the left to the points marked A A, closing together towards the points marked B B, of which each is distant about 3¾ inches from each side of the bearing. There are generally, above and behind the hind teats, two small, oval marks, formed by the hair descending or growing downwards, marked E E; each about two inches wide and three inches long. This mark is distinguished by the colour of the hair—more bright in the hair which grows downwards than in that which grows upwards. See plate 1, order 1. The first order of this class has also the interior of the bottom of the thigh, up to the bearing, of a yellowish colour, generally mixed with a number of black spots: it loosens or comes off like bran or dust. All cows which have their gravure or ecusson of those of the first class will belong to that family, notwithstanding their colour and their breed.

SECOND ORDER.—NO. II.

The cows of this order give, in their full milking, twenty quarts per day, and hold their milk until they are eight months gone in calf. The marks of this order exactly resemble those of the first, and are designated by the same letters, except that they have some soft hair growing downwards on the right, near the bearing, marked by the letter F. This mark forms an ecusson, which is about 2¼ inches long, and not quite half an inch wide. It is distinguished by a little hair, very short, and indicates a diminution of the produce of milk of about three quarts each day.

THIRD ORDER.—NO. III.

The cows of this order give sixteen quarts a day, and maintain their milk until they are seven months gone in calf. The form of their gravure resembles that of the preceding orders, except that there is a half circle of hair growing downwards, and which enforks the bearing, extending itself below about 1½ inches, being 2¼ inches wide. This mark is designated by the letter C. The colour of the hair growing down is distinguished by its brightness; it is whiter than the hair which grows upwards. There is only one oval, on the left side, above the teats, marked E.

FOURTH ORDER.—NO. IV.

The cows of the fourth order give fourteen quarts of milk a day, and hold their milk until six months gone in calf. This order differs from the others, because the hair which grows upwards has not so wide a surface. The points A A are narrower under the thighs; the points B B are nearer the bearing, from each side of which they are about half an inch distant. On leaving these points B B, you find the hair growing downwards which surrounds the bearing, and forms two triangles, marked C. These triangles are distinguished, also, by the brightness of the hair, which is whiter than the hair which is growing upwards.

(*To be continued.*)

AGRICULTURE AND THE RURAL POPULATION ABROAD.

FRANCE.—No. VIII.

THE DEPARTMENTS OF THE DEUX SEVRES AND THE CHARENTE—POITIERS AND ANGOULEME.

[FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.]

Leaving the frontiers of La Vendée, I proceeded eastwards from Bressuire to Thouars and Loudon, and then southwards by the Saumur road to Poitiers, traversing the department of the Deux Sevres, and advancing southwards through the old province of Poitou to its ancient capital. A few leagues upon the way brought a speedy change in the face of the country. Hill and dale, ridge and hollow, grew less precipitous, then less marked, and at length fined and melted away into soft wavy undulations.

The tree-lined hedges became rarer and thinner—the fallow crops of furze and thorns vanished, and with them, to a very great extent, the expanses of coarse cabbage; the country grew more and more open and champagne—more France-like in fact; and by the time the grey ramparts of Thouars were left fairly behind, I found myself traversing a vast arable plain, the great sweeps of distant land assuming that purple tinge which characterises the horizon of a level and partially wooded country. Presently the hedgerows, with here and there an exception, disappeared altogether, and the eye ran uninterruptedly for miles over fair expanses of corn land, studded here and there with oak, apple, and walnut trees. Sub-division of property prevails to a considerable extent in the district, the small holdings being chequered here and there with large farms. Ploughing was going actively on, and it was often easy to distinguish the larger agricultural enterprises from the ground belonging to small proprietors, by the widely different fashions in which the work was being performed. In the former cases, four, and sometimes six oxen were yoked to large and sufficient ploughs, and at the end of each furrow the turning of the team was as complicated a process as the wheeling about of the Lord Mayor's state coach. On the small tenements, one shaggy pony, or two lean mules, formed the animal power employed, and the plough was almost universally guided by a single stilt, furnished with a cross-piece as a handle. When the work was finished, the implement was never left in the fields, but was simply reversed and dragged home—the iron portion, supported by the yoke, binding together the mules' heads. In this district, I was told that the usual arrangement as to ploughing, when a small proprietor wished to borrow a neighbour's implement and mules, was to give in return a day's labour upon the lender's farm. The vineyards, which abound amid the corn-fields, are differently cultivated from those further north. The plant, which is larger-leaved and yellower in hue, is left to grow unsupported by any stakes or trellis work—so that the rough and tangled jungles of branches present a very different spectacle from the trimly-arranged and neatly-trained vines of the Loire. The bourgs in which the peasant proprietors dwell are further apart than in Vendée; but here and there the fields are dotted with single white-washed and tolerably substantial stone cottages, the interiors of which are, however, frequently poor and bare enough. Infinitesimal morsels of garden are generally attached, and every cottage has its well. The fields hereabouts are perfectly alive at this season with innumerable flocks of geese, destined for the most part to fall victims to the merry time of smart work and good cheer—the in-gathering of the crowning harvest of the season, the vintage.

Pausing in a lonely village, at the *poste aux chevaux*, I had an opportunity of seeing how they manage the cross-country mail carts in France, one of which had just drawn up to change its jaded horse, reeking with the toil of a ten or twelve miles stage. The machine was a species of square yellow box perched upon two wheels, and carrying, well squeezed together, three passengers besides the driver, with a perfect castle of luggage upon the roof. Arrived at the relay, a heedless helper proceeded to disencumber the horse of his harness; but the moment that a fatal strap—attached to the trams and passing beneath the animal—was removed, up tilted the cart, the greater part of the weight of which had been sagely placed behind the wheels; and had it not been for the speedy help of the bystanders, who, seemingly accustomed to such accidents, promptly flung themselves upon and held down the trams, the astonished travellers inside would have been favoured with a topsy-turvy movement for which they had not bargained. I observed that the horse was ingeniously freed from his trappings in such a fashion as to leave most of them dangling loose between the trams. In fact, there was only one set of harness for two steeds, the second being neatly backed into the vacant accoutrements of his predecessor. The belly-band was then duly adjusted, so as to preserve the ticklish equilibrium of the conveyance, and away it went, amid the usual grand display of skill in the art of whip-cracking.

The open and partially-wooded country which I have described continues in a greater or less degree until the landscape is seamed by the deep and precipitous valley of the Clain—a pretty gorge, woody, precipitous, and vine-patched, with a silent, weedy river, shining quietly at the bottom. From either bank a corn-clad tract of table land stretches away to the horizon, dotted with white isolated houses, until the expanse is broken upon the left by the glen through which run the bright waters of a tributary rivulet. On the shelving hill beyond the point of junction, furnished by its position with natural rocky ramparts and a natural running fosse, rise sloping ridges of wan grey masonry, crowned by many solemn towers and monkish steeples—being the ancient city of Poitiers. This is a mazy labyrinth of winding old lanes, dark passages, and stair-streets, broken up here and there by the grim masses of great old churches, and washed as it were by the waves of vineyards, clustering upwards from the river-side until they disappear among the garden walls and houses.

In one respect the environs of Poitiers resemble those of Tours. The rocky banks which border the Clain and its tributary are pierced with cave dwellings, in the same fashion, although not to the same extent, as the limestone cliffs of the Loire. The Poitiers rock is, however, harder, and less apt to crumble, and in consequence, the appearance of the hollowed-out tenements is happily less calculated to create unpleasant ideas touching the chance of their occupants being some day buried alive within them. All round Poitiers, market gardens, kept in the most exquisite state of cultivation, abound. They are divided into plots, frequently not much bigger than a good-sized carpet, and are honeycombed with wells, showing the large share which irrigation has in keeping the land in its exquisite state of fertility and heart. Looking down upon these sloping gardens from the cliff above, you almost feel as if their proper place would be beneath a glass case, so perfect is the state of neatness which constant and laborious manipulation has brought them to. Here the minute-division system is seen in its best aspect. The land is fertility itself. A city is at hand to buy at good prices as much vegetable produce as the soil can possibly bring forth. Every yard, therefore, is made available to the utmost, the nature of the culture happily requiring for its full development precisely that which its proprietors have to bestow upon it—patient, unremitting, and careful hand labour. Here neither expensive implements nor great establishments are necessary for the due cultivation of the soil—a moderate degree of intelligence, personal skill, and industry suffice, and the consequence is the existence of a vast number of comfortably situated peasant proprietors.

Climbing up any of the long steep faubourgs to the open country beyond, you find almost the same degree of sub-division; but the results, the land being under corn or grass crops, are very different. The culture, although equally careful, is not equally efficient. The peasant breaking up the clods of the open field for seed, with his short handled *pioche*, is producing no such profitable effects as would result from a like process carried on in the market-garden. The proportion between the value of the labour and the value of the commodity produced is altogether changed—the former becoming extravagant as compared with the latter. By the help of a good plough and a sturdy pair of horses, the large farmer will effect as much in a day as the solitary labourer with his spade or hoe in a week; the work, too, being as much more effectually, as it is more rapidly accomplished. Still the people talked with obvious satisfaction of the infinitesimal partition system. Some of the more intelligent of the peasants were aware that in England there were very few small properties, and they contrasted what they conceived must be the unhappy position of the labouring man in such a country with his condition in a district where, to use the words of one of them, "*Chacun a son petit morceau de cette terre, que le bon Dieu nous a donné pour tous.*" "We all help each other," this individual added, "we could not get on without that. I am now working in a neighbour's ground, and I am paid by him 25 sous per day. When the land requires to be ploughed, there is always somebody ready to do it for a reasonable payment. If I had a patch of land which I could not cultivate myself, I would engage a neighbour to do it for me. I would give him half the sowing seed, he would find the other half, do all the necessary work, and then, at harvest time, we would divide the product." I was informed by several of the peasantry, that the large farmers in the neighbourhood were shy of engaging as servants men possessing any property of their own, being always suspicious that some portion of the time for which they paid would be surreptitiously devoted by the *employé* to his own proper interest. The style of the agricultural implements used upon the small properties may be inferred from the simple fact, that the prime cost of a plough which I saw at work had been—so its proprietor assured me—just four francs, or 3s. 4d.! The machine consisted simply of two pieces of wood, fitted into each other at a blunt angle, one of them supporting the yoke borne by the mules which dragged it, the other forming the single stilt. At the point of junction a piece of sharp stick served for a ploughshare. There was not an ounce of iron about the whole machine, and it turned an imperfect furrow of a couple of inches or so in depth. In the large farm establishments, however, I ought to add, that there is to be noted a decided improvement over those further to the north and west. The outhouses are more substantially and regularly built; the yards cleaner, with the dunghill confined within due bounds; the stacks of hay and corn better piled and thatched, and altogether the aspect of the entire arrangements more business-like and systematic.

The traveller who wishes to ascertain the species of food ordinarily consumed by the labouring people about Poitiers will find little difficulty in the inquiry. He has only to saunter through the long straggling suburbs about noon or one o'clock on a pleasant sunny day, and he will find the whole population discussing their meal in the street—groups of chairs set before doors and windows, and *al fresco* dinner-parties everywhere going on. The banquet, as may be imagined, is not ceremonious. All partakers are armed with clasp-knives, no forks, and hold their plates on their knees. The dishes in vogue are greasy-looking vegetable stews, drowned in broth, and diversified either by a bit of meat or a herring, acting as a nucleus to the *plat*—or vast hunches of coarse brown bread, sometimes set off with a small slice of meat, sometimes eaten with yellow lumps of melon. Wine is universally drunk, its price being somewhat under twopence a bottle. However meagre the dinner fare may be, dinner would not be dinner without a dessert, composed either of more bread and grapes, or more bread and walnuts. Potatoes seem little used, white or green haricots being the standard representative of the vegetable world. The houses, at the doors of which these meals were consumed, appeared generally poor enough. Earthern floors were all but universal. A single large but low apartment frequently made up the dwelling. The furniture in most cases consisted of one or two beds, an old chest of drawers, and two or three stools. Some of the worst houses—mere dark, airless dens, piled up against the rock which rose behind—I found tenanted by handloom weavers, making sackings and coarse fabrics of the kind. They complained that, work as they might, they could not earn above 18 sous per day. When the rock projected, as it sometimes did, into the street, niches were cut in it, and deep wells sunk at their extremities; while on the deep slope above some of the larger gardens, small artificial ponds, sometimes roofed over, had been constructed for the purpose of easy irrigation.

The day on which I arrived at Poitiers I found official proclamation being made of the opening of the vintage in the different localities of the commune. In France everything is conducted with such military order and uniformity; so much, in fact, at the word of command, that a man cannot even judge when his grapes are ripe enough for being gathered in, but must submit his opinion or his convenience to the will of "the authorities." A proclamation to the following effect was stuck up in every corner of Poitiers:—

"PROCLAMATION OF THE VINTAGES FOR THE COMMUNE OF POITIERS.

"The Mayor of the city of Poitiers having considered the reports of the visits to the vineyards of the commune—made by the commissioners appointed by him for the purpose, reports from which it appears that the commissioners have proceeded each one to the spot indicated to him, and that they have scrupulously examined into the state of ripeness of the grape—decrees that the vintages shall commence."

(Here follows a long list of vineyards, and the dates varying from the 5th to the 8th of October, in which the vintage labour was to begin in each.) The document goes on as follows :—

"In consequence of the above, the Mayor forbids the commencement of the vintage until the aforesaid different days, under penalty of fine ; and likewise prohibits any person from entering the vineyards to glean or pick up spoiled grapes until eight clear days after the vintage shall have been finished, and the potatoes and peas which may be planted amid the vineyards shall have been ingathered."

A concluding paragraph warned the *gardes champêtres* and others to keep a strict look-out after delinquents to the rule. There was altogether something, as it struck me, very national and characteristic in the whole tone of the document. Only imagine in England the mayor of a country town sending out inspectors to examine into the state of the wheat crops, and then issuing a proclamation fixing the day upon which each farmer is to begin his harvest work. The French people have been sixty years struggling for liberty, they have made three revolutions for it, and their newspapers are at this moment ringing with dissertations upon constitutional and abstract rights, yet it appears that the owner of a vineyard is not yet invested with so much freedom of judgment as to be able to form his own opinion upon the ripeness of his produce, or so much freedom of will as to be allowed to gather in his own grapes in his own fashion, and at his own time. In the course of a *table d'hôte* conversation upon the subject, the system was generally defended as convenient, and in the end telling to the advantage of all parties—the council of inspectors being pronounced to be able to form, collectively, a better judgment as to the state of the grapes than the most experienced individual grower; and the instance of the simultaneous opening of the shooting season, throughout a whole department, at the proclamation of the perfect, was cited, with more plausibility than justice, as a case in point. The practical working of the system I soon had occasion to observe. The vintage in the commune of Angoulême commenced the day after my arrival in that city. In a ramble through the adjoining country, in the course of a cloudy forenoon, threatening speedy and heavy rain, I found myself in a deep pathway forming the boundary of the commune. On the one side of the way the people were actively at work with their baskets and cask-loaded carts among the vines, securing what they could before the advent of the impending deluge ; on the other, amid vineyards growing in precisely the same soil, and exposed to precisely the same weather influences, the cultivators of the neighbouring commune stood, with folded arms, waiting at once for the rain and the *imprimatur* of—mystic and tremendous words in France—"the authorities."

Leaving behind the valley of the Clain and the monkish steeples of the Poitiers churches, the traveller to the southward finds himself again journeying along a vast tract of open country, stretching away in interminable sweeps, here and there broken at dreary intervals by lines of hedges or by rows of trees, which towards the horizon blend in one indistinct dusky green. The paucity of houses and villages is very remarkable. From the top of an eminence the eye can range over leagues of arable and pasture land, unbroken by a trace of habitation. Hovels for the temporary shelter of the cultivators, or holes dug by the cross-road sides, as in the Beauce, indicated the distance from their dwellings at which the people worked. Sometimes, indeed, I was told the pilgrimage to the field and back occupied a good fourth of the labourer's day and energies. Along this road horses were seldom seen used for agricultural purposes, and in many instances the oxen were replaced by donkeys, yoked to the usual liliputian plough. The latter clever animals indeed abounded, pulling small country carts or carrying packs along the road ; the vicinity of the wine-houses in the scattered villages, where a score of them would be sometimes tied up a time, being musical with their most sweet voices. In the fields few cowswere to be observed, but abundance of sheep, pigs, and goats in mingled flocks, tended by women, who sat in groups upon the grassy banks, knitting or spinning with the distaff. These flocks are frequently the collective property of the bourg or village, and after harvest time are pastured indiscriminately among the fallow, stubble, and meadow lands, except where a wisp of straw stuck upon a stick warns the shepherdess that the field beneath is tabooed. In the stagnant small towns through which the road passes there is little characteristic, except the peculiar market-place with which each of them is furnished ; business being transacted beneath a great wooden shed, almost entirely roof, perched upon very low stone pillars, and somewhat resembling, in its arched and symmetrical proportions, the gothic ceiling of some great old hall, lifted from its walls, and placed on low supporters upon the ground.

Through this unbroken *steppe* of undulating corn land, garnished very rarely with a wayside cottage, up hill and down dale, cleaving right through and through the mouldy building of the occasional village, and the dark stripes of shady forest land, the road runs as straight as a stretched cord for scores and scores of miles. From a balloon you would see it like a whitish tape, splitting the country from horizon to horizon, without swerve or turning. It is dreary travelling. Gradually you attain the height of a long swelling ridge—a vast shallow valley sweeps out beneath and before you, roughened by wavy undulations—over the summit of each of which, and on till it vanishes in the horizon, the eye follows the one interminable line of dreary inevitable road. A league or a couple of leagues off you mark the dark crawling speck, which gradually enlarges and assumes shape and consistency, and at length nears and passes you under the guise of a *chaise de poste*, or an unwieldy country cabriolet, or perhaps a dusty diligence lurching down hill or crawling up. Now and then a little caravan of carriers' waggons, each with its long line of stout horses, comes plodding wearily by. Perchance a group of foot-sore wayfarers budge alongside, as if cheered by the jingle of the bells—soldiers on furlough in unbuttoned undress uniforms, with their canteens slung at their button-holes, or pedlars bending beneath their boxes of cheap ornaments and gaudy finery. Except when passing such a group, the road and the fields are alike unbroken by the cheerfulness of animal life, for miles and miles of solitary journeying. The diligence rolls on at its sullen, unbroken pace, like Shelley's "leaden-footed hour." No cheery greetings pass between the box seat and the cottage door. Squatted upon his perch, the thong-like reins in his right hand, the whip in his left, the peasant driver, in blouse and *sabots*, thinks only of shouting in his uncouth jargon to the sweltering team beneath. The sleepy conductor only rouses himself mechanically at the relays; and from his greasy leathern pouch pays the guerdon of the postilion of the stage. Five more strong, big-boned, unkempt horses are attached to the hempen traces. Another peasant—the image, in blouse and glazed hat, of his predecessor—assumes the reins; and on, on—at a pace as monotonous and regular as the never-ending road—the waggon-like coach goes rumbling and lurching on its way, rolling with its top freight of piled baggage—and scores of *malles* and *sacs*—containing the fashionable finery which, an hour after the termination of the journey, will be exhibited by the slovenly crowd of night-capped and great-coated passengers, who have been alternately grumbling and snoring for a couple of hundred miles.

Approaching Augoulême the table land is seamed with valleys, and in each valley pastures green as emeralds, glorious clumps of trees, bright vine slopes, and delicious coppice wood and willows, burst with a charming sense of fresh variety upon the view. The cultivation of Indian corn appears, too, rapidly to increase. On the Loire we had only mere plots and patches of the graceful plant, speading out under cottage windows. Proceeding gradually southward the plots have become fields; and by slow degrees these increase in number and extent until you perceive that "Spanish wheat," as maize is here called, is a not unimportant item in the list of rural productions. Cottage dwellings, some of them with a more or less villa aspect, increase rapidly as you approach the steep hill girt with the ancient ramparts of Angoulême. At at Saumur, white soft stone is plentiful, and the houses take their hue from the geological formation of the land. Walnut groves, maize fields, vineyards, and melon beds follow each other in rapid succession; and then, rising over belts of greenest meadows, from the still margin of the transparent, though weedy Charente, you see the white walls and *romanesque* cathedral tower of the *chef lieu* of the department.

Like Poitiers, the environs of Angoulême are composed in a great degree of tracts of the most exquisitely tended market-gardens, studded with cottages, isolated or flung together in little clumps, and bits of outlying faubourg. Round them, vines for the production of table grapes are trailed, or formed into bowers and arcades, twining round elaborately-fashioned trellis work. Very often little patches of flower gardens appear beneath the shelter of those viny arbours—gaudy specks, amid the sober expanse of cabbages, onions, potatoes, maize, and beet-root—divided into curious little plots, which stretch away for miles around the city. Turning your back to Angoulême, and traversing this vegetable girdle, you find yourself in a waste of vineyards and maize fields, divided by thick and heavily-timbered hedges, and interspersed here and there with straggling woods, green glades of walnut trees, and thriving oak and beechen coppices. The country is thickly peopled. Large farm-yards, imposing-looking piles of grey masonry, clustered bougs and isolated cottages, succeed each other rapidly. When I explored the district, the vintage was close at hand, and the population seemed for the nonce converted into coopers. Before every cottage door there was a muster of every hooped and staved vessel capable of holding the luscious juice. Men were dragging old, dusty, cobwebby pails and tubs from their recesses in grimy cellars, hammering and patching up their defects, while the women and girls cleansed them with copious supplies of boiling water. With a jovial-looking, mottle-faced little man, hard at work upon his wine casks, I had my first conversation. Everybody, I said, seemed to have taken to coopering. "And very bad coopers they make," he replied, "but we must have something to hold the wine. There's myself, for example—I'm a mason—what do I know of coopering; but I must still manage somehow to make these casks tight. We shall be all up to the elbows in grapes in a day or two, and now we're getting our tools in order." In haste though the extempore cooper was, he flung down his hammer and invited me into his house. It consisted of two ground-floor rooms, one of which was more a store place, the other the living or sleeping apartment. It was paved with small round stones, like the streets in old-fashioned towns, and was principally taken up with two very large beds. This arrangement I found universal in houses of the class in the district. "*Ah,*" my host went on, "*ce n'est pas ici un vilain pays.* Most of us live tolerably at our ease; we have nearly all bits of land, and some have trades besides. That is the way we get on. When I am working at my trade my wife and children hoe and weed in our little patch; and, when work is slack, I turn to in it myself. We have big farms here, and little properties; and if the little properties are too small to occupy us altogether, or for us to live on, they always help to get us through the year. Most folks here have four meals a day. Soup regularly morning and night. We put a good deal of Spanish wheat into it: that makes sweet soup. The bread it makes is not so good; but there is a little of that eaten, too. The bakers don't sell it—they will have nothing to do except with wheaten bread; but the poor people mix the flour of the Spanish wheat with the ordinary grain, and bake for themselves. For the meat for the soup we often use, hereabouts, salt pork. Most cottagers keep a couple of pigs or so; and there is always enough of bread and cheese and onions. You see we don't live so badly, by any means. If a man, a good labourer, hires himself out, he gets from 20 to 25 sous a day, and his food. If he is not boarded, he may make from 35 to 40. There are a great number of people here who grow Spanish wheat entirely for the poultry and the pigs. You will see great flocks of turkeys in the fields: they are fed almost entirely upon the maize. That is the practice upon the large farms; but we small people don't think ourselves above good maize meal. The little land I have I plough with a pair of donkeys. The plough is there—you will think it a very small one; but donkeys are small, too, and can't drag one of the heavy, new-fashioned, perfected (*perfectionnés*) ploughs at their tails. I don't keep the donkeys myself—I hire them when I want them; and I either pay by the day, or I work the fare out at my trade."

This, I think, is the substance of the amateur cooper's statement. There is not, perhaps, any phase of French rural life prettier, after its fashion, than the gathering-in of the harvest in a walnut-wood. Near Angoulême I came upon several such scenes. The clumps of walnut trees in themselves made delicious woodland glimpses. They consisted of, for the most part, stately growing timber, spreading their wide boughs above pleasant green turf, quite free from underwood. In the glades thus formed stood many wains, with their patient oxen, receiving the bags cf nuts as they were gradually made up. All the wood was alive with men and women, dashing the nuts to the ground and raking them into heaps upon the turf. The labour was merrily conducted; and from tree to tree, and bough to bough rung shouts of laughter, as the threshers crawled with their long poles among the branches, sending down showers of pelting nuts upon their comrades beneath. At this sort of work the French peasant seems to fling off much of his usual stolid apathy; and the timid or awkward climbers were hailed with loud shouts of rustic raillery as they stumbled about and clung to the waving branches. There are a few, but not many, chesnut trees about Angoulême. The roasted nuts are sold in the market-place; but they by no means form the staple article of subsistence, which they do in the more central portions of southern France.

I visited, and was politely shown over, a large farming establishment—the people to whom it belonged being, however, the proprietors, and not the mere tenants of the land. The farm-buildings in general in this part of France are constructed on a large scale, and in a substantial and massive fashion. The broad roofs, sloping very gently from the ridge to the eaves, give them somewhat of an Italian air; while variety and picturesqueness of outline are secured by the irregular square towers used as storehouses for hay and straw, and by the fantastic turrets and pinnacles which project from angle and gable. These unpractical qualities, however, constitute the chief merits of the Charente farm-buildings. The wandering artist, with his sketching portfolio under his arm, would see far more to admire about them than would the stern agricultural reformer, zealous for cleanliness and well-ordered economy of space. The farmyard which I inspected near Angoulême was decidedly conducted upon Maclartian principles. In fact, from the house door to the barn door, and from the barn door to the stable door, it was one big dungheap, adorned by a series of stagnant pools, which a regiment of ducks were quacking over. In one corner was a handsome *pigeonnier*, but no birds were kept; and the place was choked up with piles of furze wood and brush, for burning, and the *debris* of a host of broken old agricultural implements. The stables and the cowhouse faced the dwelling portion of the building. The barn and cart-shed, opposite the great entrance gate, were surmounted by squat square towers, composed only of wooden framework, upon the yard side, and filled with loosely-piled hay. There were a few ill-made stacks, arranged amid the cabbage and potato plots, of slovenly-kept unfenced garden behind. The stacks were, as usual, placed upon the ground; for the iron or stone pillars so common in England, and which, with their superincumbent platform, preserve stacks from surface-damp and vermin, are apparently unknown in France: at all events I have not as yet seen a single specimen.

The mistress of the farm conducted me into the dwelling-house. It consisted for the most part of two very large but low-roofed rooms, irregularly shaped. Both were paved, as was the passage, with round pebbles, and the principal articles in either apartment were the same—two large beds. In one of these rooms dinner was going on at the time of my visit. The partakers were those of the farm servants whose duties happened to be in the barns or close to the establishment. Those further a-field carried their dinners with them; feasting, so my conductress told me, upon bread and cheese, with perhaps a morsel of bacon, or salt herrings, onions, and garlick. At home the meal mainly consisted of bread and cheese, with stewed vegetables, particularly messes of beans swimming in butter, and served up in large brown earthenware dishes. There was a dessert of grapes and walnuts, and no lack of wine. Presently my cicerone, leading me to a commanding window, pointed out the extent of the farm. It might be perhaps sixty or eighty acres of the richest corn and vine land, with an additional goodly slice of the meadow, which bordered upon the clear waters of the Charente; and on which half-a-dozen cows and half as many horses were grazing: in fact, the whole constituted a remarkably snug little property, bringing in an income which, in France at least, would be very considerable. In dress, however, and manner of living, the owners were evidently on a perfect par with the ordinary peasantry. The entire household, servants and all, ate and lived together. The mistress was attired exactly like the *bonne*, both of them wearing homespun dresses and bandanna handkerchiefs twisted round their heads; and both of them helping alike in the ordinary family and farmyard drudgery of the establishment. The male farm servants in this part of France are engaged for very lengthened periods of service, often for seven years—occasionally for twelve or fourteen: in fact they often become virtually a portion of the family, and live and die in the same service. The wages given range from 153 to 330 or 350 francs per annum, with board and lodging.

The country around Angoulême is so thickly wooded, so overrun with hedge and coppice, and intersected by so many puzzling close lanes—that it reminds one of Vendée; as in the latter province bourgs, or clusters of dwellings as distinguished from villages, abound. The houses hereabouts are of somewhat higher pretensions than those which I described in my last letter. Each establishment is a small, highly walled farmyard, with great massive gateways, flanked by postern-doors. In point, however, of dulness and dirt, of dilapidated walls and crumbling roofs, of outhouses —mere shapeless heaps of piled stone and crazy timber—these settlements of peasant proprietors are to the full as miserable places as can be conceived. Inside the houses, earthern or stone paved floors are universal. The doors always open from the air to the living room, within which a variety of rural occupations is carried on, which would be more in place in the yard or the barn. Winnowing by wind and with small fanning machines are both practised.

Will all the stagnant dulness and unmitigated filth of those places, they have their charm in the masses of luxuriant vegetation in which they are, as it were, plunged over head and ears. Vines trail along wall and roof—crops of Indian corn fling up their graceful stalks and pennant-like leaves from every corner in which lie a few spare feet of mould. Superb walnut trees overshadow the whole. You may pass a dozen of these bourgs and not see a soul; all life seems to be torpid within them. Now and then a child cries or a dog barks, or you mark the grey hairs and wrinkled face of an old man, sunning himself at an open window—but otherwise there is no intimation that the place is else than deserted. The author of that marvellous word-picture of still-life, " Locksley Hall," would find inspiration for a similar poem in the rank luxuriance of vegetation—the abounding (so to speak) riotous growth of herb and grass and tree, and the crumbling decay of roof and threshold, which so strangely co-exist in these hamlets, looking in their solitary desolation something between a collection of homes and a collection of tombs.

Like Poitiers, Angoulême crowns the summit of a steep hill. Ten miles off you can see its range of grey ramparts and white houses rising like a dusky cloud over the green champagne country beneath; and once arrived at the foot of the ascent, there is a long dismal climb to be undertaken up a tedious zigzag way before you debouch upon the straggling open market place. Notwithstanding its situation, however, Angoulême is better supplied with water than nine-tenths of the towns of France. In the great majority of French cities the water supply is drawn either from private or public wells, or the fountains in the squares; and the expenditure of time, labour, and money in having it conveyed by pailfuls is of course considerable. In Nantes numerous watercarts bear about filtered Loire water, and retail it at a sou the pail: filtered though it be, however, the beverage is anything but crystalline. In the smaller French towns you will see, in every yard and every recess of the street, men and women labouring at the windlasses and heaving-up bucketfuls from deep, slimy, moss-grown wells. Angoulême, however, has had the public spirit to establish a regular waterworks system. Similarly situated to Nottingham, a similar plan has been adopted. An abundant supply is pumped by means of a powerful waterwheel turned, by the current of the river, into a reservoir situated on the highest peak of the hill. The water is derived from the river; which, though weedy, is clear, and receives the sewerage of the town further down. In the reservoir, however, the fluid undergoes the usual filtrative process, and is then conducted in pipes through the streets. A great many public fountains or stop-cocks have been established by the municipality, to which all have free access; and in which the water is always "on." These are universally used by the poorer people. Houses of a superior class have water introduced into their courts and kitchens; and in stables it is common to have a cock and a trough in every stall. The supply in case of fire is, as may be conceived, always abundant.

The staple manufacture of the town is paper, for which it enjoys some reputation. All the mills, about twenty in number, are situated in the green valley of the Charente, and are set in motion by its waters. The establishments which I visited seemed admirably constructed, and were kept singularly clean. The room in which the rags were torn to pieces only put me rather in mind of the shoddy mills in Yorkshire. The machinery itself was well boxed up; but the aperture by which the dirt and worthless fibres were blown out into the air presented a very respectable outpouring of " devil's-dust," which had encrusted in layers two or three inches deep upon the tiles. The process is in all important respects identical with that pursued in our own paper mills; and the rags are collected after the same fashion by hawkers, who patrol the country, gathering them and selling them to the rag merchants. The picking out of the seams is performed by women at the mill: it is hard work for both eyes and fingers, and is usually paid for by the piece. Some of the workmen earn more than a franc a day, but the average was stated to me as amounting to about 18 sous. In every *atelier* where females worked they were superintended by a man. The cutting and folding of the paper is performed by children, who make from five to ten sous per day. In seasons of good trade some of these mills work night and day, by relays of hands; the night workmen being paid a trifle more than the day labourers.

Upon the meadows above and below the town are a number of establishments for salting, preparing, and drying cod fish caught in the North Sea, and intended for inland consumption in France. A small wharf for the barge to land its cargo, a set of pickling and washing tubs placed beside it, a light wooden shed (where the fish are piled in heaps to drain), and a series of horizontal ropes on which they are hung to dry, make up the *materiel* of each establishment. They are obliged to be situated at a certain distance from the town, out of respect for the noses of the inhabitants; and certainly the precaution is not useless. The load which the breeze bore away with it from a field in which a couple of thousand or so of split and salted cod were dangling upon hooks, was anything but a balmy one. Women were the sole operators in preparing the fish for the market. They washed and scrubbed them in huge tubs, piled them up to drain, and then hung them up to dry. The season during which this species of employment is afforded lasts six months, from August to March. The women are paid by the piece; some of the best workers earning upwards of 2 francs a day.

The barges used upon the Charente, to ply between Angoulême and Rochefort, are peculiar in their construction. To look at them, one would imagine that they were ordinarily shaped lighters; but, examining more closely, you find that they are curiously shallow and flat-bottomed—built, in fact, very like an ordinary ship, with the whole bulk beneath the water-line cut away and replaced by a flat flooring. These craft carry one mast and large squaresail, after the fashion of the barges of the Loire. They are manned by three hands and a captain; and on their downward passage float with the current. In ascending, they either sail or are tracked along by relays of oxen.

FARM BUILDINGS ON A SMALL SCALE.

When the Royal Agricultural Society of England offered a prize for the best essay on the arrangement and construction of farm-buildings, suited to our present knowledge of farm management and stock feeding, we have the authority of the judges for saying, that a competition so valuable never before took place; and of the one which obtained the prize, that of Sir Thomas Tancred, Bart., and that of Mr. Sturgess, which was published by the Society, as being the most valuable of the rest, we were struck by the fact that both were by far too expensive and elaborate for any small occupation, and with the necessity there was for an arrangement much more simple and inexpensive.

Along with the essays was an article published, from the pen of H. S. Thompson, Esq., who with gigantic labours of a philanthropic and useful character combines a judgment on matters of agriculture equalled by few men in the country, and who invariably says what is apposite and judicious. He thus sums up a series of remarks on the essays, as combining the points to be aimed at, in the arrangement of farm buildings :

"1. That the communication between the different buildings of a farm should be by means of a paved macadamized yard, and not across a straw fold.

"2. That provision should be made for the introduction of loose boxes or stalls for fattening cattle.

"3. That small open yards with covered sheds should be provided for young or store cattle.

4. "That covered manure pits are not generally advisable."

Now to the last clause only would we take some exception. For, while we would protest most strongly against any general or indiscriminate covering of fold yards to exclude the rain, &c., we think that a dung-pit, made for the chop and refuse of stall-fed cattle, and into which all the tank water can be pumped, is a most valuable contrivance. We have great pleasure in giving a paper from a judicious correspondent, on cheap and useful

FARM BUILDINGS ON A SMALL SCALE.

Sir,—As the repeal of the duty on bricks, and the improved practices in cultivation, will probably cause much to be done in the erection and modifications of farmsteads, a few hints from a farmer, for planning them, may be interesting and beneficial to both owners and occupiers of farms. Amongst the numerous plans published or erected, we find many faults which ought to be avoided. This is the consequence of architects being unacquainted with agriculture, and farmers being ignorant of architecture.

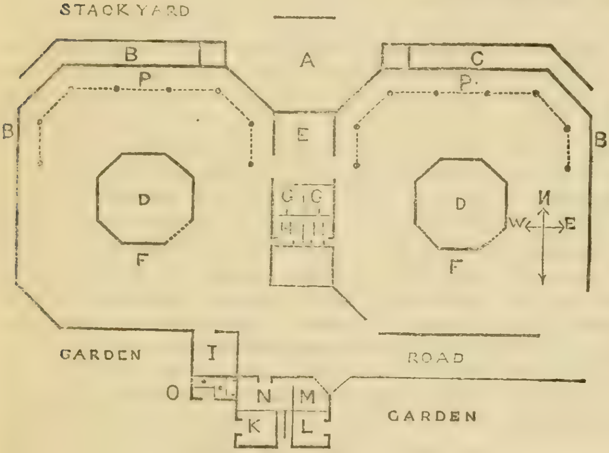
The following may be considered as general rules, subject to variations according to peculiarity of circumstances: First, the homestead ought to be placed in a dry situation, not too high, but well supplied with water, and as near the centre of the tillage land and the road as circumstances will permit. It should be comfortably sheltered and ornamented with screen plantations; and thus protected from boisterous winds, without being so much closed up as to exclude fresh air, which is extremely important for the welfare of both man and beast, and quite necessary for the drying of the stacks; the plantation should therefore stand at a respectful distance. Secondly, the homestead should be sufficient, but not more than sufficient, for the requirements of the farm. A large farmstead is expensive, both in erection and in repairs, and is frequently far more inconvenient for the occupier than a smaller and less expensive but better arranged one would be. Thirdly, sharp angles in the farm-yard should be avoided, as they are dangerous to animals. Fourthly, a good aspect is important, both for the farm-house and the houses or sheds for live stock. Fifthly, the convenient position of the various buildings is also very important. The barn may generally be best placed with the ends to the north and south, and the doors at the east and west sides; and the dwelling-house on the south or south-east or south-west side of the farmyard, near enough to overlook it, but not immediately adjoining it. The stables, cattle-sheds, and byers may be placed on the north, east, and west; and the south,

south-east, and south-west sides of the yard left open for the animals to get the benefit of the sun. An octagon, or a square with the corners cut off, is perhaps the safest and most convenient form for the farm-yard, in the middle of which an octangular or circular dung-pit may be placed, covered with poultry-houses and dovecote. The stackyard may be on the north, north-east, and north-west sides, with a carriage-shed, covered with a granary, adjoining or near to the barn. Wherever it can be done at a reasonable expense, a stream of water should be conducted to the farmstead, for the supply of a reservoir, the working of the machinery, the watering of the cattle, and for the irrigation, conjointly with tank water, of a meadow below; a covered tank with pump being placed beneath or adjoining the dung-pit. The reservoir should be so placed on the high side of the buildings as to be capable of watering the cattle in the houses, and flushing the drains, carrying all the surplus water into the tanks, or on to the meadow, as may be desired: water is a most valuable servant when under such good command as to be turned at the will of the occupier.

Fearing that I have already trespassed too much on your valuable space, I will reserve a few more hints for a future paper, if you should consider them worthy of insertion.

A Retired Farmer.

THE PLAN.



(A) Water-wheel, or horse-wheel, or steam-engine with chop-house and cooking-house on each side.

(B and C) Stables or beast-houses opening into the yards.

(D D) Dung-pits, with poultry-houses and dovecote over.

(E) Barn. (F) Foldyard. (G G) Pigsties with yards at H.

(I) Ash-hole. (K) Kitchen. (L) Parlour.

(M) Common sitting or business-room.

(N) Scullery. (O) Privies. (P) Open sheds.

There are several points in the plan of considerable importance. The sheds are so constructed that they can be left either as open kennels, or can be, by mere rails, costing a trifle, converted into boxes or stalls. The premises are so constructed as to be eligible for the whole drainage of the buildings, being poured by drains into the dung-pits, instead of the costly manual labour often so necessary to dispose of the liquid manure.

The waste steam will cook the food for the stock, when the engine is working, and the power will drive the chopper and mill, while the barn is sufficiently central for both conveying chop and litter either to the cattle or the horses. The fermenting dung in the pits will warm the dovecote and poultryhouse, so as to have early broods of fowls or pigeons.

The weak point in the sketch—which is more for an idea of the principle in constructing such buildings than from a scale to work out the details—*is the approach to the barn*. This must either be by a very circuitous round past the stables or cattle-houses, or it must be close by the horse, water, and steam power place (A); and, awkward and uncertain as the latter may be, we do not see how it can be remedied.

We have in all plans found the difficulty of placing the barn in the centre of the buildings, and especially convenient for the cattle-stalls, the stables, the cooking-house, and the clop-placer or mill, and at the same time to secure a proximity to the stack-yard.

We think there is quite room for the Royal Agricultural Society of England to offer a prize for the description of a set of farm buildings suitable for a small farm, and where *cost* should be an element as well as convenience.

By-the-by, what has the Highland Society been doing to make no award for their essay on farm buildings this year? Could it be there was no competition? We think agricultural societies should take up this subject in earnest now.—Gardeners' and Farmers' Journal.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Weekly Council was held at the Society's House in Hanover-square, on Wednesday, the 30th of April: present, Mr. Raymond Barker, V.P., in the chair, Lord Berners, Don D. Savignon, Mr. Brandreth, Mr. Brooks, Mr. Burke, Mr. Burton, Mr. W. G. Cavendish, M.P., Mr. Clavering, Mr. Cobon, Mr. Davy, Mr. Flack, Mr. Gadesden, Mr. Garret, Mr. Gooch, M.P., Mr. Fisher Hobbs, Mr. Majendie, Mr. Milward, Mr. C. E. Overman, Mr. Parkins, Mr. Pendarves, M.P., Mr. Rowlandson, Professor Sewell, Mr. Stansfield, M.P., Mr. Stephens, Mr. Stone, Professor Way, and Mr. Wolryche Whitmore.

The following were among the presents made to the Society: The Transactions of the Yorkshire Agricultural Society (containing an interesting series of experiments with coprolites, peat charcoal, &c., as manure for Turnips); Mr. Tanner Davy's Prize Essay on the Management of Farm-yard Manure; Proceedings of the Royal Institution of Great Britain; Transactions of the Horticultural Society, the Statistical Society, the Entomological Society, the Highland and Agricultural Society of Scotland, and the Royal Jersey Society; the Farmer's Magazine; Mr. Lee's Report (through Mr. Chadwick) on the application of Sewerage Water to Irrigation and Agriculture; and M. Desplanques' "Exposé sur l'Industrie de la Laine:" for which the Council ordered their usual acknowledgments to the respective donors for their attention to the Society in offering these donations.

The Council then adjourned to Wednesday, the 7th of May.

A Monthly Council was held at the Society's House, in Hanover-square, on Wednesday, the 7th of May; His Grace the Duke of Richmond, K.G., President, in the chair. The following members of Council and Governors were present:—Earl of Ducie, Earl of Chichester, Lord Berners, Lord Southampton, Lord Bridport, Lord Portman; Sir Thomas D. Acland, Bart, M.P.; Sir M. W. Ridley, Bart.; Sir Charles Lemon, Bart., M.P.; Sir John V. B. Johnstone, Bart., M.P.; Colonel Austen; Mr. Raymond Barker; Mr. Barnett; Mr. S. Bennett; Mr. Bramston, M.P.; Mr. Brendreth; Mr. W. G. Caveudish, M.P.; Col. Challoner; Mr. Evelyn Denison, M.P.; Mr. Druce; Mr. Foley M.P.; Mr. Garrett; Mr. Brandreth Gibbs; Mr. Grantham; Mr. Fisher Hobbs; Mr. Kinder; Mr. Jonas; Colonel Le Couteur; Mr. Milward; Mr. Pendarves, M.P.; Prof. Sewell; Mr. Shaw, London; Mr. Shelley; Mr. Sillifant; Mr. Simpson; Mr. Slaney, M.P.; Mr. Spencer Stanhope; Mr. Stansfield, M.P.; Mr. C. Hampden Turner; Mr. Turner, Barton; Mr. Jonas Webb; and Mr. Wilson, of Stowlangloft.

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, presented to the Council the Report on the Accounts of the Society, to end of the previous month; from which it appeared that the current cash-balance in the hands of the bankers was £1,668, (including £850 on account of Life-Compositions). The Chairman also laid on the table the quarterly statements of income and expenditure, funded property and liabilities. This Report was received and adopted.

Country Meeting of 1851.—Lord Portman laid before the Council a report from the General Windsor Committee, which was received and adopted.

Country Meeting of 1852.—The Council were favoured with the attendance of Deputations from the South-Eastern District, including Viscount Torrington, Hon. Henry Fitzroy, M.P., Hon. Henry Brand, Sir Edward C. Dering, Bart., Sir Henry Shiffner, Bart., Mr. Deedes, M.P., Mr. Dodd, M.P., Mr. Law Hodges, M.P., Mr. Davey (chief constable of the borough of Lewes), Mr. Ellman of Glynde, Mr. Figg, Mr. Laing (chairman of the South-Eastern Railway Company). Mr. M'Gregor (chairman of the Brighton and South Coast Railway), Mr. Monckton (town-clerk of Maidstone), Mr. Alderman Randall, Mr. Scudamore, Mr. Tanner, Mr. Tootell (Mayor of Maidstone), and Mr. Alderman Whichcord. These gentlemen kindly furnished to the Council the fullest information connected with their respective localities, and the facilities of communication which each of them offered in reference to other localities of the district or to the metropolis; and received, through the President, the best thanks of the Council for the favour of their attendance on that occasion.

Mr. Raymond Barker, Mr. Fisher Hobbs, Mr. Brandreth Gibbs, and Mr. Milward, then presented to the Council the Report of their personal inspection of the localities offered in the towns of Lewes and Maidstone, and their respective vicinities, for the purposes of the Society, in reference to its Country Meeting to be held in 1852, in the south-eastern part of England. The report gave a detail of the position and amount of accommodation of each of the proposed sites, and concluded with the expression of an opinion, that either of the places in question fully met the requirements of the Society as a locality for its Country Meeting, and at both of them the members of the Inspection Committee received from the authorities every kind facility to promote the object of their inquiries.

The Council then proceeded to make a selection of the particular place at which the Country Meeting of 1852 should be held, when it was finally carried, on the motion of Mr. Brandreth, seconded by Mr. Shelley, that Lewes should be the place of such meeting. The Lewes Deputation, on again being invited into the Council-room, were informed by the President of the decision to which the Council had then come, and informed of the condition under which it was made, namely, that the chief officer of the borough of Lewes should, by that day week, conclude with the Secretary of the Society the usual agreement for the ratification and fulfilment of the stipulated engagements.

Country Meeting of 1855.—The Council having already decided on the South Wales district for the Country Meeting of 1853, and the North-East Midland district for that of 1854, proceeded, on the motion of Lord Portman, to constitute Lancashire, Westmoreland, Cumberland, and the Isle of Man as the district of the Country Meeting to be held in 1855.

Judges.—The following committee was appointed for the selection and recommendation to the Council, of judges for the Windsor Meeting, namely, the Earl of Ducie, Mr. Barnett, Mr. Brandreth, Col. Challoner, Mr. Druce, Sir John V. B. Johnstone, Bart., M.P., Mr. Jonas, Mr. Milward, Mr. Shaw (London), Mr. Simpson, and Mr. Stokes.

Pavilion Dinner.—Mr. Raymond Barker having called the attention of the Council to the number of persons for which the Dining Pavilion in the Home Park, Windsor, should be constructed, it was carried, on the motion of Mr. Shaw, seconded by Mr. Bennett, that accommodation should be provided for a number nnt exceeding 2,000.

Election of Members.—Mr. Fisher Hobbs having moved, and Sir M. W. Ridley seconded the motion, that, for the purpose of leaving the weekly meetings free for practical discussions, an alteration should be made in the bye-laws, by which the nomination and election of members should be confined (like other official business, as now arranged), to the monthly councils. This motion was carried, with an amendment made by Lord Portman (who conceived that every facility should be afforded to those friends of agriculture who wished to join the Society, and promote its practical objects), that, while the election should be restricted to the monthly meetings of the Council, the proposition of candidates should take place at every meeting of the Council, whether weekly or monthly, as had hitherto been the rule of the Society.

Captain Pelham.—The President expressed his deep regret, on the loss sustained by the Society in the premature death of the Hon. Captain Pelham, and announced the vacancies which that loss occasioned in the Council, and in the list of stewards of implements.

The Council then decided on the arrangements connected with the ensuing general meeting of the Society on the 22nd May, at 12 o'clock; and adjourned to Wednesday, May 14, when Professor Way would deliver a lecture before the members, on the agricultural employment of common salt.

The May General Meeting of this Society was held on Thursday, May 22, at the Society's House, in Hanover-square. The chair was taken at 12 o'clock by his Grace the Duke of Richmond. Amongst those who were present were, Earl Ducie, Lord Camoys, Sir R. Joddrell, Mr. R. Barker, Col. Challoner, Mr. W. Shaw (of the Strand), Mr. Knight, &c.

The CHAIRMAN having observed that the first business of the meeting was the election of a President for the ensuing year,

Mr. RAYMOND BARKER said, in rising to propose a President for the ensuing year, he was induced to recall the attention of the meeting to the formation of the society, and to the practice which had prevailed in previous years in reference to this election. They had always sought to have at the head of the society a nobleman connected with the agricultural interest, one who was not only eminent in his position in society, but also in reference to agriculture; and the practice had been to request one of the Vice-presidents to accept the office of president. The nobleman whom he had to propose as President for the ensuing year was Earl Ducie; who, from the period of his first connection with the society, had been warmly interested in agricultural objects, and in the advancement of agricultural interests. Not only in the cattle department, but in the mechanical department also, had the noble Earl taken a very prominent part. He was not satisfied with placing on his estate the best breeds of stock that could be purchased at all the great sales, but he had established at his own cost an iron-foundry for the manufacture of implements of agriculture. One of the noble Earl's implements, the Uley cultivator, had justly obtained celebrity throughout the land, and was considered by members an incomparable machine. Whether that machine or Biddle's scarifier were preferable might be open to question, but it was declared by all who had used it to be an article of the first utility (Hear, hear). He might observe that the noble earl would have been proposed two years ago; but, considering the valuable services of the late Lord Downshire, it was thought desirable at that time that that noble Lord should be elected President. An opportunity, however, now presented itself of electing the noble Earl; and he felt great pleasure in proposing that his Lordship should be the President for the ensuing year.

Mr. HUDSON (of Castleacre) seconded the motion. He fully concurred in all that had been said by Mr. Barker with respect to Lord Ducie. He knew that the implements which his Lordship had brought into use had produced a powerful effect as regarded the bringing land into a proper state of cultivation; and, on the other hand, his lordship had introduced, not only for his own benefit, but to the advantage of all around him, some of the best stock that money could procure (Hear, hear).

The motion was then agreed to.

On the motion of Mr. R. BARKER, seconded by Mr. KNIGHT, the trustees were unanimously re-elected.

Mr. SILLIFANT, of Devonshire, in moving the re-election of the Vice-presidents, said: Coming, as he did, from the West of England, he felt, with agriculturists generally in that part of the country, how much they were indebted to the officers of the institution for the efficiency of the arrangements on the occasion of the meeting at Exeter; and on this account he felt very great pleasure in proposing the motion.

Mr. COSENS (of Devonshire) seconded the motion; which was then adopted.

The meeting then proceeded to the election of 25 members of the Council, by filling up papers in the usual manner. Scrutators were appointed to examine the votes; and after a short absence they reported that they had examined the voting papers, and that the house list was adopted.

The SECRETARY (Mr. Hudson) then read the following report of the Council:—

REPORT.

The Council have to report that since their last General Meeting in December, the Society has been deprived by death of 65 of its members, including Sir Francis Lawley, Bart., one of the founders and trustees of the Society, and the Hon. Captain Pelham, a member of the Council and one of the Stewards of Implements at the Country Meetings of the Society; 216 names have also been removed from the list, while 163 new members have been elected during the half-year: the Society accordingly now consists of—

91 Life Governors,
162 Annual Governors,
674 Life Members,
4175 Annual Members, and
19 Honorary Members;

making a total of 5121 general members on the list of the Society at the present time.

The Council have transferred the name of Colonel Challoner from the general members of Council to the class of Trustees of the Society, to fill the vacancy in that list occasioned by the decease of Sir Francis Lawley; and they have elected Mr. Pendarves, M.P., into the Council, to complete the required number of their members.

The chemical investigations are proceeding in a satisfactory manner, and the subject of the absorptive properties of clay soils in reference to manuring matter continues to receive from Professor Way the attention which its importance demands. The torrefaction of soils, or burning of clays, for the purpose of effecting a beneficial change in their mechanical condition and physical properties, has been selected by the Chemical Committee as the new subject for investigation on the completion of the analysis of marls; and the Council hope that members residing in districts where such process is adopted with success, will take an early opportunity of sending to the Secretary specimens of such fertilizing clays, in their natural as well as in their burnt state, along with a statement of any facts within their knowledge connected therewith. As Consulting-Chemist of the Society, Professor Way has spontaneously offered to reduce his charges to the lowest possible scale for making analyses of guano for the members; and as the Council consider a special analysis of that manure to be the only safeguard against the attempts at fraud so extensively practised by unprincipled dealers, they trust that the members of the Society will avail themselves of so cheap, simple, and effective a means of security.

The Council have decided to renew the grant of £200 to the Royal Veterinary College, for the year, for the purpose of aiding that institution in carrying out one of the original objects of the Society, namely, "The improvement of the veterinary art, as applied to cattle, sheep, and pigs:" such renewal being made under the following conditions:—1. That all members of the Royal Agricultural Society of England shall have the privilege of sending cattle, sheep, and pigs to the Royal Veterinary College on the same terms as if they were subscribers to it; and 2. That the Royal Veterinary College make a report at the end of the year of their proceedings in connexion with this grant.

During the past half-year the Council have made such alterations in their bye-laws as will restrict the official business more completely to the Monthly Meetings, in order that the Weekly Meetings may be given up entirely to short introductory lectures, leading to subsequent discussion and the communication of personal experience among the members, on topics connected with practical farming. Professor Way and Professor Simonds have each expressed their willingness to take such part in these proceedings as the Council may from time to time think desirable, and will make arrangements accordingly.

On a former occasion the Council reported to the members the offer of a site in Hyde Park for the Society's Agricultural Show of Breeding Stock: the conditions for the occupation of that site, however, which were subsequently submitted to the Council by the Commissioners of Woods and Forests, were such as the Council, acting on the part of the Society, could not accept. The First Minister of the Crown then expressed his desire to promote the objects of the Society by the offer of a site to which, from its locality, no such conditions as those necessarily required in the case of Hyde Park would apply. Accordingly, Her Majesty's consent on his lordship's representation was at once given for the Society to select a site in such one of the Royal Parks of Hampton Court, Bushy, or Kew, as might be found on inspection most suitable for the purposes of the Society. The Council, in pursuance of this offer, decided to select a site in Bushy Park, and were placed by the Government in communication with the Commissioners of Woods and Forests and the Master of the Horse, when the Authorities of Windsor informed the Council of the gracious permission of Her Majesty, and that of His Royal Highness Prince Albert, to place the Home Park of that Royal demesne at the disposal of the Society, as a site for the purposes of that Country Meeting, should the Council consider it preferable to the one already selected in Bushy Park. The Council, on the report of the same Committee of Inspection that visited Bushy Park, decided that the Country Meeting of the present year should be held in the Home Park at Windsor, agreeably with the permission thus so graciously conceded to the Society: a permission which the members of the Society will not fail to regard as not only most gratifying in itself, but as enhanced in its value by the prompt and condescending manner in which it has been communicated.

The attractiveness of the Home Park as a site for the meeting, and its immediate contiguity to the Great Western and South Western Railways, will no doubt tend to the access and accommodation of a larger number of visitors than have attended on any former occasion. Notwithstanding the short period during which the Mayor and Corporation of Windsor had on this occasion an opportunity of making arrangements for the Society's reception at a place of meeting to which they had invited its Members, the Council have the satisfaction of stating that those arrangements have been completed most satisfactorily, as in the case of other places where the Country Meetings of the Society have been held, the Mayor of Windsor, in the name and on behalf of himself and the Corporation, having entered into guarantees with the Commissioners of Woods and Forests, by which the Society will, agreeably with the Royal Permission, be granted the full and free occupation of the sites selected in the Home Park for the purposes of the Meeting, and be held harmless from all liability of damage and from all charges of occupation. The Mayor and Corporation have also placed the sum of £600 to the credit of the Society's account with Messrs. Drummond, as a subscription from the town and neighbourhood of Windsor, intended to meet to that extent the heavy expenses which the Society always incurs in the preparations for its Country Meeting. The week of the Society's Country Meeting at Windsor will commence on Monday, the 14th of July next. The Show, as ascertained from the entries made, will consist of upwards of twelve hundred head of breeding stock, and will be open to the public on the Tuesday, Wednesday, and Thursday; and the dinner of the Society will take place on the Home Park, on the Wednesday of the same week, in a pavilion constructed to contain 2,000 guests. Members of the Society who apply to the Secretary for their Pavilion Dinner Tickets between the 20th June and the 5th July, will receive them on the usual conditions. The Council have nearly completed with the principal railways throughout the kingdom the arrangements for the conveyance of the stock to and from the Show; and in every case where they have at present received a decision, a free transit has been granted to the Stock entered for the Windsor Meeting, both to and from the Show; and they have every reason to believe that the same liberal concessions in favour of the Society's Exhibitors, for the purpose of promoting the objects of the Society, will, as in former years, be conceded by the other Railway Companies to whom they have also applied. The Council have taken measures for obtaining a greater number of nominations from which to select the Judges for the Country Meetings; but they still feel the imperfection of all plans hitherto adopted for their appointment. The Council duly appreciate the great importance of a strict and impartial adjudication of the Society's prizes, by men not only disinterested in themselves, but fully qualified by their abilities and experience for the arduous task confided to them; and the Council will esteem it a favour if the Members of the Society at large will from time to time transmit to them any suggestions that may tend to promote this desirable object, and essentially to give effect to that competition for excellence which the Society, by its premiums, evinces so great a wish to excite. They have already referred it to the Judges, as part of their duty, to ascertain and report to the Council any failure in the due shearing of the sheep, or any excess in the market-condition of the animals inconsistent with their character as breeding stock. They consider that the higher the character of their Judges becomes, the more powerfully will they be able to aid the Council in repressing many of the abuses alleged to take place in the competition for prizes. They also hope that the time is not far distant when the judgments given in the Show-yard, in the case of Live Stock, will be founded on well-defined and acknowledged principles, having reference, in each class, to some assigned standard of excellence; and that these judgments, although formed on less distinct and constant data than in the case of implements, may gradually approximate in some degree to uniform and consistent results, that may prove, like those in the implement yard, satisfactory, at the same time, both to the Judges and the competing exhibitors; and thus tend to establish those points of form, development, and quality which constitute perfection of breed in the different classes of animals adapted for agricultural purposes.

The Council have selected Lewes as the place of the Country Meeting of the Society for the year 1852; and they have at the same time constituted a new district for the Country Meeting four years in advance from the present time, agreeably with their usual practice. The rotation of districts, therefore, now stands as follows:—

1852—SOUTH-EASTERN DISTRICT, comprising the counties of Kent, Surrey, and Sussex.

1853—SOUTH-WALES DISTRICT, comprising the whole of South Wales, with the addition of the counties of Gloucester, Hereford, Monmouth, and Worcester.

1854—EAST-MIDLAND DISTRICT, comprising the counties of Leicester, Lincoln, Nottingham, and Rutland.

1855—NORTH-WESTERN DISTRICT, comprising the counties of Lancaster, Westmoreland, and Cumberland, and the Isle of Man.

The Council, in conclusion, have every reason to congratulate the Members on the continued prosperity of the Society, and on the undeviating manner in which it steadily pursues those practical objects connected with the improvement of land, the management of crops, and the general advancement of good husbandry, in which all its Members are more or less deeply interested.

By order of the Council,

JAMES HUDSON, Secretary.

Sir RICHARD JODDRELL moved, and Mr. WINGATE (of Lincolnshire) seconded, the adoption of the above report.

Mr. R. BARKER, as Chairman of the Finance Committee, presented the following financial statement for the year:—

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Half-yearly Account, ending the 31st of December, 1850.

RECEIPTS.

	£	s.	d.
Balance in the hands of the Bankers, 1st July, 1850	2,435	3	8
Balance in the hands of the Secretary, 1st July, 1850	19	17	3
Dividends on Stock	160	6	1
Life-Composition of Governor	50	0	0
Life-Compositions of Members	239	0	0
Annual Subscriptions of Governors	85	0	0
Annual Subscriptions of Members	1,508	17	0
Receipts on account of Journal	234	13	0
South-Devon Prizes	50	0	0
Receipts on account of Country Meetings	1,143	2	11
	£5,925	19	11

(Signed) Thomas Raymond Barker, Chairman,
C. B. Challoner,
Thomas Austen,
Finance Committee.

PAYMENTS.

	£	s.	d.
Permanent Charges	£178	12	6
Taxes and Rates	13	15	2
Establishment	422	13	0
Postage and Carriage	20	8	6
Advertisements	13	8	0
Law Expenses	99	5	5
Payments on account of Journal	740	14	7
Chemical Grant	100	0	0
Chemical Investigations	100	0	0
Veterinary Inspection	12	12	0
Prizes of the Society	1,517	14	6
South-Devon Prizes	50	0	0
Payments on account of Country Meetings	1,903	15	1
Sundry Items of Petty Cash	3	9	5
Balance in the hands of the Bankers, 31st December, 1850	738	2	8
Balance in the hands of the Secretary, 31st December, 1850	11	9	1
	£5,925	19	11

Examined, audited, and found correct, this 16th day of May, 1851.

(Signed) Thomas Knight,
Robert Beman,
Geo. I. Raymond Barker,
Auditors on the part of the Society.

Mr. **Barker** observed that the Finance Committee would be very glad if any member of the society would take the trouble to look into the accounts for himself, and ascertain on what system they were kept, instead of resting satisfied with the report of the Auditors. He was convinced that there were few, if any, societies whose accounts were kept more accurately. The accounts might, in fact, fearlessly be produced for the inspection of any one (Hear, hear).

Mr. **Batten** (of Somersetshire) had great pleasure in moving that the thanks of the society should be given to the Auditors. There was no more irksome duty connected with the society than that which devolved on those gentlemen: at the same time there was no more necessary one; for, unless the funds of the society were properly managed, the remainder of their operations would be sure to fail. It was very satisfactory to have such a report as they had then received.

Mr. G. **Dyer** seconded the motion; and it was unanimously adopted.

Mr. **Knight** (one of the Auditors) in returning thanks, said the the accounts were kept in so efficient a manner that, strive as they might, the Auditors could not find out a blunder (Hear). Their duty was a very pleasing one.

The **Chairman** then officially informed Earl Ducie that he had been elected President for the ensuing year.

Earl **Ducie** said he had to thank his Lordship and the meeting for the honour that had, rather unexpectedly, been conferred upon him. Had it been offered to him at any previous period within the last five or six years, the state of his health would have obliged him to decline accepting it; but he was happy to say that he had now such a glimpse of returning health, that to refuse the offer made to him would be to show a want of respect, not only for the Society as a society, but for its individual members. It was not impossible that the state of his health would be such as to preclude him from performing efficiently the duties of the office in which he had been placed; but, if he had occasion to draw upon their kind consideration, it would be his misfortune, not his fault. He had no doubt that he would receive while in office that liberal support which had always been extended to his predecessors; and that, aided by the kind consideration and forbearance of the members, he would be enabled to discharge his duties (cheers).

Mr. W. **Shaw**, of the Strand, moved a vote of thanks to Professors Way and Simonds. He said, feeling that everything connected with the literary department of the society (more particularly as regarded the Journal) was of vast importance, and knowing how far Professors Way and Simonds had helped to explain, in intelligible and easy terms, the application of science to agriculture, he felt very great pleasure in rising to move that the thanks of the society should be given to those gentlemen. No men could evince greater readiness to comply with any request made to them on the part of the society, whether by delivering lectures, or by promoting in any other manner the objects in view; and he felt that they should not evince that gratitude which was due to those who had rendered eminent services, if they did not that day pass a vote of thanks to these two Professors.

Mr. R. **Smith**, of Exmoor, seconded the motion; which was then put, and carried.

Professor **Way** begged to return thanks for the kindness which had been thus manifested towards Professor Simonds and himself. They were at all times most anxious to fall in with the views of the society, as far as they thought their doing so would tend to the benefit of its members. The lectures given by himself during the past year were not very numerous; but it had been determined that short lectures should be given at the society's weekly meetings, and the first lecture of that kind would be delivered at 12 o'clock on the following Wednesday, the subject being Super-phosphate of Lime. As far as he was individually concerned, he must confess that his path did not seem very plain at present. He had no doubt that ultimately chemistry would throw an immense amount of light on agricultural subjects. It was certainly his earnest desire that it might do so; and he hoped that in the mean time those who are engaged in agricultural pursuits would make every allowance for the tardiness of the steps which were taken in an onward direction (Hear, hear). Hitherto, practice had outrun science: it remained to be seen whether science would not soon take the lead. He hoped that in agriculture, as in all other pursuits, it would do so in the end; but they must wait patiently (Hear, hear).

Colonel CHALLONER said, twelve months ago he had the honour of proposing that the Duke of Richmond should be the President for the year then ensuing, and he would leave the meeting to say whether or not that proposal gave universal satisfaction to the society and to the public (cheers). Every day showed how great was the interest which his Grace felt in agriculture, and that a better man could not be selected to fill such an office cheers). It was peculiarly fortunate that his Grace happened to be the President during what might be termed an uncertain period in the society's annals. During the past year circumstances had obliged the Council to make alterations such as they had never before thought themselves justified in making. The changes from Hyde Park to Bushy, and from Bushy to Windsor, were quite unforeseen; but the noble Duke steered the ship to a good haven at last. He had no doubt that the holding of the meeting in the Home Park at Windsor would prove acceptable both to agriculturists and to the public at large. In all periods of difficulty the conduct of the noble Duke was marked by that straightforwardness by which he was characterized, and at the same time by that ability which resulted from experience. It was, then, with great pleasure that he asked their concurrence in a vote of thanks to his Grace for the services which he had rendered to the society during the past year.

Lord CAMOYS briefly seconded the motion, which was then put by Colonel Challoner, and carried by acclamation.

The CHAIRMAN said he could assure the meeting that he did not feel that he deserved thanks. He joined the society at first with a firm conviction that an institution of that kind was very much needed in this country, and he thought results showed that it had done some service (Hear, hear). He need scarcely say that, as an individual, he would at all times be most happy to do his best to promote improvements in the cultivation of the land. He would advise all present, on returning to their homes, to solicit the members of the society to come in great force to the Home Park, at Windsor. He was always glad to see a large concourse of the farmers of this country; but on this occasion he had an additional reason for desiring a large assembly. He wished to see congregated under the ancient Castle of Windsor a numerous body of the intelligent and influential agriculturists of Great Britain, in order that foreigners who visited the cattle-show, and dined with them on this occasion, might see some good samples of the English farmer (Hear, hear). He felt deeply grateful for the tribute of respect which he had just received, and he would be indeed unfitted to receive such a tribute if he did not take every opportunity of showing that he was not totally unworthy of the confidence reposed in him.

The meeting then separated.

NEW MEMBERS.

The following new members were elected:—

Barrett, Stephen, Harewood, Leeds
Bolton, Lord, Hackwood Park, Basingstoke, Hants
Denman, Arnold, South Malling, Lewes, Sussex
Elmhurst, Rev. E., Shawell Rectory, Lutterworth, Leicester
Faviell, Mark, jun., Syndale-hall, Pontefract, Yorkshire
Ferard, Charles Cotton, Ascot-place, Windsor
French, Richard Day, St. John's, Bungay, Suffolk
Ganthorpe, Henry, Norman-road, Rusholme, Manchester
Gardiner, Samuel Weare, Coombe Lodge, Reading
Hepburn, George, Chesham, Buckinghamshire
Hollwey, M. de Bethman, Prussian Legation, London
Lutener, Thomas, Dolerw, Newtown, Montgomeryshire
Parker, Thomas James, Endcliff, Sheffield
Roberts, Frederick Rowland, Aberystwith, Cardiganshire
Sterriker, John, Driffield, Yorkshire
Southam, Henry, Uppingham, Rutlandshire
Taylor, Isaac, Castle-house, Flint
York, James, M.D., Wharncliffe-house, St. John's-wood.

ROYAL AGRICULTURAL SOCIETY'S MEETING IN 1853.

A highly respectable meeting was held on Monday, May 5, at the Town Hall, Newport, Monmouthshire (W. C. Webb, Esq., Mayor, in the chair), when the following resolutions were unanimously agreed to:—

Moved by THOS. HUGHES, Esq., Justice of the Peace, and seconded by HENRY COLLINS, Esq., of the Duffryn, and carried:—"That the Royal Agricultural Society having determined to hold their Country Meeting for the year 1853 within the South Wales district, comprising the whole of South Wales—with the addition of the Counties of Monmouth, Gloucester, Hereford, and Worcester—Newport appears to be, from its focal position and the peculiar facilities there afforded of railway and water communication, the most eligible spot for the purpose."

Moved by E. DOWLING, Esq., proprietor of *The Merlin*, and seconded by the Rev. D. A. R. STEPHEN, and carried: "That an application be made to the Council of the Royal Agricultural Society, to hold their meeting in Newport in 1853."

Moved by JOHN HELLICAR, Esq., corn merchant, and seconded by R. KINSEY JONES, Esq., agent to Sir C. Morgan, Bart., and carried: "That, inasmuch as, in the event of the Society consenting to hold the meeting at Newport, they would require a considerable sum of money to be placed at their disposal towards the expenses to be incurred, that subscriptions be entered into for the purpose of providing the necessary funds, and that the several bankers in the district be requested to receive subscriptions."

Moved by WM. WILLIAMS, Esq., timber merchant, and seconded by THOMAS DOWLE, Esq., of Itton Court, and carried, "That the earnest co-operation of the landed proprietors, manufacturers, tenant-farmers, tradesmen, and inhabitants of the district be solicited."

Moved by R. J. Catchcart, Esq., solicitor, and seconded by Cornelius Evans, Esq., and carried, "That the following gentlemen be appointed the local committee for Newport, with power to add to their number, viz., the Members for the County, the Member for the Borough, the Mayor and Town-Council for the time being, Thos. Prothero, Esq., Thos Powell, Esq., Henry Collins, Esq., W. L. Cartwright, Esq., J. Hellicar, Esq., W. Williams, jun., Esq., J. Fraser, Esq., Jas. Brown, Esq., J. Rennie, Esq., J. J. Cordes, Esq., M. T. Winter, Esq., and R. Kinsey Jones, Esq."

Moved by E. Dowling, Esq., and seconded by James Brown, Esq., and carried, "That the thanks of this meeting be given to the Mayor for his conduct in the chair."

The meeting then separated. Mr. W. Williams acted as secretary.

TO LANDOWNERS, ON PERMANENTLY BENEFITING THE AGRICULTURAL AND LANDED INTEREST.

Gentlemen,—The 5th of Elizabeth created idleness and beggars; to remedy this, the 14th of Elizabeth, afterwards extended by the 53rd, created poor rates and competition of pauper against industrious labour. The present poor laws are upon the reverse system, viz., non-competitive pauper labour, which is the right principle, but the mode of carrying it out is most erroneous, as it destroys the value of pauper labour for which there is no call; for it is as easy to establish a non-competitive farm as a non-competitive union workhouse. There is this material distinction between the two—the workhouse is always calling for poor rates, but the farm wants none, it can maintain itself. If we divide the labour of paupers into two classes—1st, the able bodied men, worth 1s. 6d. a-day each; and, 2ndly, the partly infirm men and the boys, at 6d. a-day each, and calculate 10 per cent. of the first class (there were 25 per cent, in the Barham Union, near Ipswich), and 15 per cent. of the 2nd class, a parish would get annually from paupers, in labour alone, £1,750, besides their manure, and there being a medium through which to feed pigs gratis, which, under the present system, is completely lost, to the injury of landowners and rate-payers. But, to ascertain the wealth of labour, it is not what I *give* a man, it is what I *get* by him. Therefore, if 500 paupers, of all grades, were placed upon a non-competitive farm of 500 acres, 400 acres out of the 500 will well maintain the paupers, horses, cows, and pigs; and the pigs &c., will pay the rent and taxes and every expense, leaving 100 acres to turn into profit; yet these 100 acres cannot be detached from the farm, as they are wanted for rotation of crops; but there is always on the farm 100 acres for profit, with labour and manure cost free. Then, as science has developed the value of flax, so as to cause a growing demand for it, and as it requires a number of hands to cultivate and prepare it, which this farm possesses, then let flax be grown; and, as land and labour have not to be deducted from the return, that return cannot be calculated at less than £12 per acre or £1,200 a year, clear profit. This is extra, besides abolishing poor rates, by having your paupers on a non-competing farm instead of a non-competing union workhouse. Then what does this show and prove? Why, this—that capital, land, and *population*, are producers of wealth as well as a coal, tin, or copper mine. Talk of getting rid of the poor rates; why, paupers on a farm are the best investment for capital in England, and would pay a private company 25 per cent. Why is an acre of land in the city of London worth 100 acres in the country? Answer—Capital and population. This proves the argument, that where capital and population combine, wealth is the result. Capital is the mainspring which puts the activity of the population to work; in a large town, houses on houses arise, carriages on carriages are built, &c., builders, carriage makers, &c., get rich, and their wealth sets somebody else to work, who gets rich also. So on these farms, all is activity, every inch of the 500 acres is a producer. Children grow up, become men, and their labour is wealth for the parish which advanced the capital. Is not this better than locking up labour, or forcing otherwise honest labourers to become thieves and burglars sooner than be locked up? Some may ask, of what use are these old, lame, and blind paupers on the farm? The answer is, their manure is superior to guano, it contains more ammonia and potash, less phosphates, but which may easily be supplied by a few dissolved bones; that the urine of man contains every requisite for the food of plants; that the respiration of these people is of incalculable value, by furnishing plants with carbonic acid, whereby all plants will grow better on this than any other farm. It has been calculated that the sewages of London discharge into the river Thames manure worth nearly half a million of money annually. Then what have we on this farm tantamount to a certain extent of a London sewage, with all its wealth? That these old, lame, and blind people are of value on land, its productions will show, independent of their pig-keeping. Some may say that pig-keeping competes against the farmer. Nothing of the kind: it is against America, as flax-growing is against Belgium. These farms do not compete against industrious labour, but benefit it, as they receive all the overplus labour, which otherwise would be fighting for half its loaf; nor will they injure the labour market, as the labour is on them in reserve for a demand; for no man will work for sheer keep, if he can get wages; but if there should be an extra demand for labour, which with our population is not likely, and these farms have to hire some labour of the first class, they can afford it. These farms are farms voluntarily withdrawn from competition against the farmer—for the farm that had used to sell cattle, corn, and sheep, against him, is stopped, as these do not; so that, in preventing paupers from competing against industrious labour, we also prevent these farms from competing against the farmer in corn, cattle, and sheep; and these farms also make him a present of his poor rates, by abolishing them. In the Barham case, it was proved that there were 490 paupers in the house on the night of the riot, and that 120 of them were able-bodied men. The value of the labour of these men would amount, in the course of a year, to £2,808, as first class labour, saying nothing of the amount in the union of the second class labour. I will ask any man of common sense if there must not be something wrong in our poor laws to lock up this wealth, and at the same time make the parish pay poor rates. There is nothing impracticable in establishing these non-competitive farms—no difficulty about unions raising the required capital—and, now railways are almost everywhere, they are not tied to locality for a farm; and the accomodation for the paupers may be arranged under Mr. Osborne's bill, or otherwise. These are the only three principal obstacles, and they may be overcome, if you gentlemen, only think fit that they shall be overcome. If a bill could be got through parliament this session, most of the unions in England might be without poor rates by next Christmas.

I remain, Gentlemen, your humble servant,

JOSEPH WOOD.

Saint Austell, Cornwall, 8th May, 1851.

PRICES OF WHEAT AND FLOUR IN LONDON AND PARIS.

The following letter has been received in relation to the calculations inserted from time to time of the relative prices of wheat, flour, and bread in London and Paris:—

Liverpool, May 17.

"SIR,—I am an attentive reader of *The Times*, and I never fail to read the city article. I am sure you wish to be faithful, and that you will excuse me pointing out where you are in error. In the question of the price of wheat, flour, and bread in France, you are wrong all through. There is no such price as a difference of the rates you talk of—viz., 18 per cent. on wheat, 30⅜ per cent. on flour, and 49⅜ per cent. on bread. I do not know where you get your calculations, but I recommend their being revised. The thing is absurd. Bread 50 per cent. dearer in London than in Paris! why, there would be no such trade going as a waggon load of French rolls every morning into London. I know well that flour cannot be bought in France to leave a merchant any profit at present; so away with your 30 per cent.

"I enclose my card, and am a decided, but fair play, "FREE TRADER."

With reference to the above it is necessary to observe that the quotations we use are extracted from a paper published in Paris, the *Echo Agricole*, a species of price-current for the various markets of France. Our correspondent appears to found his objection principally on the price of bread, but upon this there can be no difference of opinion, since the price in Paris is regulated by law according to a scale based on the average quotation of flour for a certain previous period. The point as to the relative prices in the two countries is therefore a very simple affair, and the *data* we always give are sufficient to enable any one to check its accuracy.

The question reduces itself to this:—The two prices are 25 cents per kilogramme in Paris, and 6½d. per 4 lbs. English in London. The relation between the weights of the two countries is, that 220½ lbs. English are equal to 100 kilogrammes, which our correspondent may test by inspecting one of his French invoices of flour, or by referring to any work on foreign exchanges and weights. And, finally, at present 25 f. are equivalent to £1 sterling. With these *data* any person may prove the working of the problem for his own satisfaction:—

For if 100 kilogrammes give 220½ lbs. English, then one kilogramme must be equal to 2 205 1,000 lbs.

Next, if 2 205-1,000 lbs. (equal to 1 kilogramme) are sold in Paris for 25c., then 4 lbs. (the weight of our loaf) would be sold for 45 35-100c.

And finally, if 25f. (equal to 2,500c.) are worth 240d. (or £1 sterling), then 45 35-100c. must be worth 4 35-100d.

So that, comparing this result with the cost in London of the same weight of bread, which is 6½d. at the full-priced shops, we obtain a difference of 2-15-100d. as the extent to which the price here exceeds the price in Paris for every 4 lb. loaf; and, consequently, as 4 35-100 is to 2 15-100 (the excess), so is 100 to 49⅜, the per centage difference calculated, of course, on the French price.

It is true that bread may be bought in London below the price we have quoted, but it must also be observed that there is a second quality in Paris, the price of which is likewise fixed by law, and is now 18c. per kilogramme, the difference on which, compared with any given price here, may be calculated in the same manner as above. Bread of this quality and price at Paris is equivalent to about 3⅛d. for the 4 lb. loaf.

With the above *data* for comparative weights, our correspondent may now check our other calculations, observing that flour is quoted in Paris at a given number of francs for the 100 kilogrammes; while, with regard to wheat, the quotation is a certain number of francs per 1½ hectolitres, each hectolitre being about 2¾ imperial bushels.

We never make allusion to whether an operation "leaves a profit to the merchant," but simply give a comparison between the highest price of the best article in the two markets, and the position of the *consumer* in the respective places. When importation takes place the question arises of the charges, which must necessarily be paid in all usual circumstances by the country requiring the goods. Hence, as a general rule, the price of wheat must be higher in England than in France, because the latter more frequently raises sufficient food for all its inhabitants than is the case here, and the present difference between the prices of wheat in the two countries is not much above the expenses of importation. With regard to the much greater difference in the manufactured articles, flour and bread, than exists in the raw material, wheat, we only state the facts as they appear on a comparison of the prices in the two countries, and must leave our correspondent to draw his own conclusion when he has satisfied himself of the correctness of the quotations and calculations.—The Times.

ADULTERATED SEED.

A case involving some curious questions of agricultural philosophy was tried before the County Court of Yorkshire on 19th April, which is of so much general importance, that we cannot help giving an account of it to our readers. The damages were laid at the largest sum the court could adjudicate upon, viz., £50, and the alleged cause of damage was that a seedsman had sold either improper or adulterated seed to a farmer. Both the parties were of the greatest respectability; the one honestly, we believe, thought he was imposed upon and injured, and the other as honestly believed himself wronged and ill-treated. The facts were these: A gentleman, occupying a well-cultivated farm carried-on on a four-course system of farming, sowed in the spring of 1849 a field on which turnips had been eaten on, and with or soon after its seeding with barley: the seeds he obtained of the defendant, and which he ordered to be, and expected was, red clover. The field had been red clover the previous four years, and had been a sheep pasture at most four years before that. No fault appears to have been found with the seed at seedtime; the plaintiff sowed them, or assisted in sowing them, with his own hand, and it was not till the spring of 1850 that it appeared very thin of plant, and nearer the time of cutting there was not in the nine-acre field one acre of good clover; a patch in the middle of the field, some other small thinly-planted patches in other places, and the headland, had red clover more or less luxuriant, but the strangest thing of all was that the remainder of the field presented a full plant of trefoil. Much loss resulted to the occupier. His horses were deprived of their food, his sheep of the aftermath, and his land was impoverished for the subsequent wheat crop. He sowed red clover, as he believed; he bought it for such—he expected a crop, and it yielded trefoil; and therefore he alleged that either the seed had been adulterated with trefoil, or it had been trefoil altogether, and hence he claimed the damages. Now the reply to this was that the field was *clover sick*. It was like the bulk of the land in the North Riding of Yorkshire, which will not bear clover once in four years—some indeed will not bear it in eight—and some seems so exhausted of the clover-forming materials that it seems as if it could hardly be persuaded to grow it at all. There was every kind of symptom of clover sickness. The field had in it patches of good plant; here and there there were places where it was an excellent crop; the headlands, which so often escape in a clover-sick field, were good clover; but in other parts of the field there was not one particle of the clover plant. The state of the field seemed at least clearly to indicate that there had not been either trefoil alone sown upon it, for it would not then have grown the clover—nor that each kind had been mixed, otherwise there would have been an equal sprinkling of clover all over the field. But how came the trefoil? A botanist proved that the land was not of a character calculated to grow wild trefoil; that this field was thin and stony, and that therefore it could not be likely to have seeds deep in the soil; in short, that the trefoil to be there must have been sown.

Now, leaving apart altogether the question of the difference in the seed, which the master ought to have seen and discriminated at the time he deliberately sowed it, there were, as stated by the counsel, facts which showed that the trefoil must have been a spontaneous growth. Farmers were produced who had sown the same seedsman's clover from the same sack as the plaintiff, and where good crops were produced. Several witnesses were there to prove spontaneous growths of trefoil where none could have been sown; some in some common land where all depasturage was after the corn was taken off, and where trefoil had never been sown; some who had allowed a field to remain in its state of spontaneous production for a sheep pasture, which was intended for something else; but the most remarkable testimony of all was a gentleman who, from the same bulk of red clover-seed, sowed three fields at the same time; two came up full of red clover, and the third came up trefoil. This could only be accounted for by the fact that the two fields had been "fresh to clover," and the remaining field had been clover-sick, and that therefore the trefoil had grown spontaneously. But how came that trefoil at that particular juncture to show itself? This is a question not difficult to answer. When a sown plant does not grow, such is the fertile state of our earth, and so general is the law of its sustaining happiness and life, that few or no spots of the earth's surface but some vegetation will appear, excepting perhaps the rainless deserts. Now, if the land is well cultivated, if it be clear of weeds in root or in seed, and if from the fact of previous crops of trefoil seeding these seeds are in the ground, the air will stimulate their germination, and we shall see a cultivated plant growing which had not been artificially sown. And of all others, white clover and trefoil, being plants naturally wild in some parts of the county, are as likely to appear as the couch and the thistle. For in some years, when from luxuriant vegetation, or from some other cause, such as insufficient stooking, seeds of the trefoil or clover will be shed. To grow, it requires due proportions of air, warmth, and moisture; and the absence of one or all of these will prevent their appearance till some favourable circumstance renders them germinative, and then we have them appearing for a crop. In this case, however, the question was not decided, the decision going off on a technical point; but it only shows how cautious farmers ought to be at jumping at conclusions in matters of agricultural philosophy.—Gardeners' and Farmers' Journal.

THE MODEL FARM AT GLASNEVIN, NEAR DUBLIN.

I respectfully beg insertion for the following remarks. Business having brought me over to the Irish metropolis, and having the industrial improvement of Ireland at heart, I took occasion to visit an institution which is undoubtedly effecting a steady change in the agricultural character of that country. The institution I mean is, the Model Farm, Glasnevin, under the Commissioners of National Education.

The Model Farm is situated two English miles north of Dublin. As I approached the institution it was easy to discover order and tidiness were observed in its management by the neatness of the well-kept boundary fences. I was received most kindly by the superintendent—Mr. Donaghy—a gentleman fully alive to the duties of his office, and actuated by a warm desire for the advancement of Ireland's social and industrial happiness. I minutely inspected the establishment. The farm formerly consisted of 52 statute acres, but the commissioners, wisely acting up to their motives increased, it to 128. The old farm is well laid out, drained, deepened, and cropped, under the 3, 4, 5, and 6 courses. The new farm is steadily coming round to the desired standard. Enlarged offices being required consequent upon the additional land, and for the accommodation of an increased number of pupils, a new *suite* of farm buildings is in course of erection, situated in the centre, and commanding a view of the entire farm. The plan of the buildings is most judiciously laid down, the recognized improvements in farm offices being happily introduced. The existing buildings will be made available for various purposes connected with the farm.

The out-offices are kept scrupulously clean and ventilated—delightful to witness. Everything is kept in its proper place—performed at its proper time. The live stock consists of 21 milch cows, 2 two-year-olds, 3 yearlings, a bullock, bull, and 35 pigs. I cannot refrain from noticing a very fine Yorkshire sow, a handsomely-bred animal. There are two well-bred boars, whose services are given for the improvement of the breed of pigs in the locality. The black cattle are in good condition, of mixed breeds, and house-fed; currycombed and brushed morning and evening by the pupils. The cows are permitted three hours' daily exercise in an enclosed yard. Mr. Donaghy is cautious in buying his full number of horned cattle, having suffered rather severely from pleuro-pneumonia.

On the old farm there are two acres of winter beans in flower; the crop is not only a *model* for its style of cultivation, but as a successful inducement for a more extensive culture of the *winter* bean in so precarious a climate as Ireland. Flax, carrot, parsnip and mangel crops present a promising braird; grain crops and potatoes encouraging, grass and vetches good, the former being cut for soiling more than a month ago. Turnip-sowing is actively going forward.

There is an extensive kitchen garden attached to the farm, under the management of the Commissioners' gardener, where different vegetables for the Dublin market are grown.

There are 48 students in training—healthy, active, and intelligent young men, who engage for seven hours daily in the farm operations. Thus they acquire *practical* knowledge and *business habits* by the hand of industry. The pupils receive agricultural lectures on the week-day mornings from the superintendent, embracing the general business of farm management according to the most improved principles; the improvement of soils, the management and application of manure, &c.; and the application of scientific knowledge for the attainment of useful and practical ends. There is at the command of the pupils a well-selected agricultural library. The leading agricultural periodicals are subscribed for. A first-class literary teacher resides on the farm, who imparts to the students the elements of a sound English education.

Since Ireland may expect a large number of visitors during the season, I would suggest the Model Farm, Glasnevin, as not the last, and far be it from the least, object for admiration, in which the country abounds. I am sure every visitor will agree in the pleasure of a visit to this institution, not alone from the excellence of its management, but in the worth of its object—the gratuitous education of well-conducted and intelligent young men, selected from the national agricultural schools throughout Ireland. If the agriculture of Ireland is to progress, how can it be better advanced than by that refinement which instruction imparts? How can we bring into play the sterling qualities of the national intellect, except by a cheap and popular scheme of industrial education? Our zeal in the organization of education fails without it imprints on the character an intrinsic and indelible good by a systematic and careful study of the errors which demand reform.

With your permission, I will add a few additional remarks in another letter, on the necessity of a cheap and effective plan for educating the agricultural youth of Ireland. Yours, obliged,

Dublin, May 21st, 1851. PHILOS.

FRAUDS IN MANURES.

BY A FARMER.

We have repeatedly directed attention to the frauds practised in the manufacture of artificial manures, as well as in the sale of guano; and we have done our utmost to caution farmers against the folly of purchasing the so-called cheap manures. But until we recently made it our business to inquire into the extent to which these frauds are carried, we had no conception of the stupendous extent to which these disgraceful practices were followed. We purpose giving our readers the results of our inquiries; I must, in the first place, direct attention to the doings of men, whose position in the scientific world should have led us to expect something better. An "eminent professor of one of the universities" recently certified that a preparation of bones and acid contained 33 per cent. of soluble phosphoric acid—a quantity which he must have known was *impossible*. Another eminent chemist signs his name to any analysis sent to him, provided it be accompanied with a Post-office order for 10s. 6d. Whilst another gentleman of the same cloth refused to certify that a mixture, 90 per cent. of which was soot, was not the best possible manure for all and every crop without a fee of twenty guineas. A modest demand, which we hope was agreed to by the parties; the guineas, no doubt, silencing all conscientious scruples. With such doings amongst *scientific* men, it would be surprising if the *practicals* were far behind.

Accordingly, we found some enterprizing individuals at a little town in Norfolk grinding tanners' bark, and selling it as guano, for £6 6s. per ton. In a town in Yorkshire, a large manufactory is now going on, preparing a mixture of soot and human excrements, and for which, whilst the intrinsic value may be about £1, they have no difficulty in procuring £5 per ton. In a town in Cornwall, a fortunate vagabond managed to dispose of several hundred tons of superphosphate of lime last season; his only means of preparation being an upstairs room and an Arnott stove—an arrangement capable of producing about ten or twelve tons in as many months. In fact, there are three towns which have now attained an unenviable notoriety in this respect; viz., Hull, Newcastle, and Wolverhampton. In one of these we saw a steam engine which had been at work several weeks, both night and day, driving a pug mill, mixing Patagonian guano and chalk together—the guano even of this inferior quality being in about the same proportion to the chalk as the water was to the brandy in the Dutchman's mixture. And in another of these towns there is now a large manufactory, very busy, preparing superphosphate of lime—the result being the dried refuse of a tan yard or glue manufactory, which would be costly at 10s. per ton.

The best proof of the extent to which these mixtures and manufactures are carried is shown by the fact that at a recent sale 1,400 tons of damaged guano were sold at prices little inferior to the genuine article; and we will not greatly exaggerate the capabilities of these 1,400 tons, if we say that long ere this they have been metamorphosed into more than three times their weight of *genuine Peruvian.* In fact, the whole matter has assumed the appearance of a regular system. In preparing these guanos two things are inquired after, the first is something to dry up these wet and damaged guanos, and the second is something to reduce the genuine article without spoiling its appearance. The former is a difficult problem; the latter is easily done by ground coprolites.

Time would fail if we were to relate all the facts that have come to our knowledge; and whilst we are astonished at the extent the evil has reached, we are at a loss to suggest a remedy. To buy upon an analysis in the hands of the dealer is absurd, as many of these worthies are in the habit of attaching an analysis to everything they offer for sale, whether it be the same as that which they originally sent for investigation or not. One large dealer in guano that we know is in the habit of filling in the name of the ship last arrived to a printed analysis bearing the name of an eminent chemist, but executed some years ago.

It might have been thought that such barefaced frauds as those we have described would have exhausted the list, but we have to relate others yet more surprising. A manufacturer of artificial manures recently employed a person to lecture in various localities for the purpose of procuring notoriety for his wares. This lecturer at one place assured his hearers that these preparations were so well suited to the land, that, whilst the crops would thrive, the weeds would perish for lack of nourishment. But the crowning point of all is, that some parties have recently been able to sell a mixture of chalk and charcoal *at a price four times as great as the best tea,* the purchasers being assured that this article would supersede manure altogether.

Our readers will be surprised to learn that not less than ten manufactories of superphosphate of lime have sprung up within the last few months in the neighbourhood of London. It would be wrong to say that all these men are actuated by dishonest motives, but there must be something radically out of joint when hundreds of tons of a so-called superphosphate of lime are now being sold for 30s. per ton in that neighbourhood.

The extraordinary demand for these manufactures which has arisen within the last three or four years, is a striking proof of the energy which exists in agricultural pursuits, nothwithstanding all that may have been said to the contrary. Still, we must admit this equally extraordinary development of a fictitious article is a striking proof of the want of a knowledge of business amongst our farmers. It is in vain to assure them that Peruvian guano cannot be bought under £9 10s. per ton: they seem to have a childish delight in "bargains," which, we thought, had been confined to the gentler sex when purchasing ribands at shops placarded with announcements of "immense reductions" and "alarming sacrifices." Time alone can convince both ladies and gentlemen that the "immense reduction" is in the value, not the price of the article, and that the "alarming sacrifice" is in their own pockets.

CALENDAR OF HORTICULTURE.—JUNE.

RETROSPECT.—The weather since the date of the last calendar, 20th April, has continued upon the whole true to the equinoctial type—cold, with little sun, and below the average of years. The mean temperature of the week between the 4th and 11th of May was, at Greenwich, about 56 deg. 4 mins.: with me that of the succeeding week, ending the 18th, was reduced by cold nights to little above 50°. Vegetation, therefore, has proceeded but slowly, and many plants give proof of the mischief done by hoar frosts and pattering hail showers. On the 15th morning my night thermometer, four feet above the ground, marked 33°—is it then wonderful that a basin of water, placed in the earth in a spot not very remote, had a scale of ice quite over it? Gooseberries and currants suffered, it appears, by the rigour of April 4th previously noticed: many have fallen, not only about us, but in Hertfordshire. Some person mentions the injury done to potatoes; but I have seen no plants so advanced as to sanction the report. Roses, standards particularly, have been nipped and scorched, and are very backward. The four warmer days, prior to the severe storm of hail and rain just before sun-set of the 18th, had brought the foliage of trees, and the bloom of apple trees and lilacs, considerably forward. The oaks are in general, I think, in advance of the ash trees.

OPERATIONS IN THE VEGETABLE GARDEN.

First, and as more immediately of consequence, attend to the cutting of *asparagus,* which in general ought to cease before Midsummer Day—even earlier; but as the cold weather must have checked the advance, we may extend the cutting to a period of seven weeks from its commencement. Allusion has been made to the mode of cutting lately practised—namely, to cut off every shoot, large or small, eatable or useless, during the entire season, or in other words, so long as asparagus is cut for table use. I hesitated to justify a practice which I had never adopted; but have lately searched out the fact, and now upon unquestionable authority before me, assert that the whole of the market gardeners, and the best of those in the employ of gentlemen, obliterate every sprout, not leaving one head, however small, till the cutting for the season is finished. The error committed by those who make blanks in, and finally ruin their rows and beds, consists in continuing to cut, even into July, so long as an eatable head is discerned. If this be avoided, and persons remain contented with a fair supply for the period named, good, deeply made plantations, may remain fairly productive for 20 years. My correspondent offers the following reasons for the total removal of all shoots, he says—"The small shoots run away with much of the strength, by diverting the current of the sap from the large heads, which they diminish in size. Again, by leaving those small things, the bulk of the roots is much increased, making the crown produce in a few years 50 heads instead of 25; thus producing nothing but second rate asparagus. On the other hand, by cutting off the small shoots till the cutting finishes, the number of eyes is diminished, and the size of the next year's is much increased." Our readers who begin new beds, or possess such as yield well, are recommended to try the practice, and thus bring its theory to rigid proof.

Peas.—Though late in the season, the large sorts may be sown twice, the second time not later than the 25th. Knight's marrows, if they succeed, and escape mildew, sometimes bear profusely for six successive weeks.

Continue to sow *kidney beans* of both sorts, *lettuce, endive, radish, salading*—twice; *cauliflower* and *Cape broccoli* for succession.

Many plants receive benefit by pricking them out from seed beds into nursery beds, by inducing them to produce numerous stocky roots—such are all the *broccoli* varieties, *Brussels sprouts, borecole, cauliflowers, savoys,* spring-sown *cabbage, celery*—also *curled parsley,* which is wonderfully improved by planting 9 or 10 inches asunder. Preserve some of the best seedlings and *curled cress* and *chervil* for seed.

Plant for succession *cauliflowers* in trenched and richly manured beds.

Turnips.—Sow between the end of the first week and the 25th a full crop; choose a showery time, that is while the soil is already somewhat moist but another shower expected. Numbers of seeds are lost as to time, from being sown, without due foresight, in dry drills. We have frequently urged the necessity to prepare ground in dry weather, by water given copiously over night, covering the spot all day, and sowing late in the afternoon.

Plant, as before directed, slips, or rooted laterals, of the *sweet herbs.*

Hoe the ground about all the growing crops of peas, beans, carrots, beet, parsnips, and onions.

The *potato onion* will come into use very soon, if it has been duly treated.

HARDY FRUIT DEPARTMENT.

Grafted and budded trees.—Look over them, to loosen the ties, that they may not cut or chafe the young shoots. Support those also by well adjusted sticks, to prevent accidents from high winds. This precaution is particularly required in *pear* trees, where vigorous scions have been inserted in the rind by crown grafting.

Peaches have suffered here severely from the frost of April 4th, and generally also by repeated hoar frosts, followed by early hot sun. Look over these wall trees—disbud them of absolutely supernumerary shoots; but nip back or prune to the third or fourth leaf many others, to induce fruitful eyes. If very strong sappy shoots prevail, as they do in some trees, they indicate root-pruning—this must be thought of in due season, but not now. As a check (a very poor one) it is recommended to shorten the rampant shoots so as to force two or more shoots from one, thus dividing the sap: it might be better to cut the shoot quite away, or back so far as to leave only two eyes, particularly if there be a vacancy in any part.

Apricot fruit, if abundant, can be prudently thinned wherever two or more grow close to each other. This tree ought to be spur-pruned in places, but not shortened.

It is of great moment that *peach, nectarine, apricot* trees should be supplied with wood, regularly and equably distributed, not weak, but above all, not rank; the science, observation, and vigilance of the gardener alone, can effect this great and beautiful training.

Apples, pears, plums, and *cherries,* are spur-bearers, and must be regulated hereafter; for by acting prematurely, a tree in the flush of the sap can be rendered an unsightly mass of twigs. The *Morello cherry* tree is not properly a spur-bearer, and requires that a supply of young wood be laid in at full lengths yearly, so as to keep the heart of the tree green and fertile.

Vines.—Train carefully—secure the fruit-bearing laterals, to prevent their breaking away. Remember that the vine bears fruit only (or with few particular exceptions) on the shoots of the present year, produced from the wood of the last year.

Fig trees.—Train new wood at full length in vacant places. By the warm south coast, trees bear well without pruning, provided they are planted against a wall facing the south.

Strawberries begin to produce runners; if it be an object to propagate and make new beds, the first and best of the young plantlets are to be pegged down at once, either in the bed, or in small pots, according to the proposed object. To guard the fruit, and secure a nice quantity of ground moisture, a mulch of long grass, or the long straw of stable manure, or tan, should be preferred to any temporary and slight waterings, which really harden the soil, and do very little good.

Fruits under Glass.

Cucumbers and *melons,* grown by dung heat.—Keep the linings warm by new additions of stable manure and leaves, so as to maintain the heat. Earth up and peg the shoots in regular order: the great error in melon growing is the too early impregnating of the females before the vines of the plants have the strength which they would acquire by permitting three or four of the runners first stopped, to extend to the limits of the allotted space. Both of the fruits succeed admirably in tank-houses, or pits with low span roofs, heated by warm water. In my "Domestic Gardeners' Manual," of 1839, a full description is given of the late Mr. T. A. Knight's method of growing the fine Persian melons in pots—it is too lengthy to be copied; but the directions are invaluable, being taken from that gentleman's own MSS.

Sprinklings of water an hour before sunset, then closing the lights, to produce a moist vapour of perhaps 90 degs., appear to be the best preventive of that pest, the acarus, called red-spider.

Fruiting Pines, whether in pots or earth beds, must be kept in a moist growing atmosphere, root-water being moderately supplied once or twice a week, if the weather be sunny. Mr. Knight made it a rule to cut all his full-grown black Jamaicas before the fruit began to change colour. He once sent me two which were of a full dark green; they speedily began to change, and when the rich orange yellow was completely acquired, the flavour and texture were perfect.

Succession-house.—Give fresh pots if required, without any disrooting. "Allow sufficient room for the leaves to spread horizontally, and place them as near the glass as possible." This is good advice, as is the following—"Pines grown in the open bed, or Meudon system, will merely require attention to watering and the regulation of air, provided the bottom heat is steady. This simple and natural mode of cultivation should be put in practice whenever it is possible to do so." Weak manure water once a week is recommended. I make but two remarks on this method. The earth of the bed ought to be light, and never more than just moist; a wet, clodding soil, would create rottenness, and particularly in the Jamaica pine, a very slight and difficult rooter. The heat of the bed should be equably maintained, not exceeding 85 to 90 degs.

Vineries.—The first will have ripened its crop: then the healthy action of the leaves may be kept up by the use of the syringe, and by moderate watering of the borders and paths, premising the free admission of air. It is important to keep the leaves (without exciting new growth) so active as to recruit the vital power of the wood, and advance its maturity; by so doing, as we see it remarked by an able writer, "Vines may be forced early for a long succession of years without much diminution of their energy." The later vineries will now require little artificial heat, but every natural accessory of solar light (with shade in the hottest hour), air, and water.

Peaches.—When the fruit has been gathered apply the syringe, or rather garden engine, most assiduously—to clean away the filth that may have accumulated. If spider (acarus) or mildew appear, the sulphuret of lime wash might prove very efficacious. Promote the ripening of the wood, as recommended in the treatment of vines.

In the later houses or pits "keep up moisture where the fruit is swelling; water freely, give air early, and abundantly at noon: close early in the afternoon, having syringed the trees and wetted the borders at the same time."

Final.—The weather has improved, and though cold at sunrise of the 20th, yet the temperature became, and now is, much greater. If the melioration continue, and be not followed by cold rain and hail showers, nature will soon be most lovely. The vines in the open air remain so backward that nothing can be said of their future condition; and I have no space left to touch upon ornamental subjects, but previous notices will point to those steps which surely may be taken, now, without much hazard. John Towers.

Croydon, May 21st.

OPERATIONS FOR JUNE.

Bedding Plants.—Whatever remains to be performed in this department must be finished without delay; the beds neatly raked over, and proper attention paid to watering until the growth commences. Verbena beds of the strong growing kinds should be stuck full of short birch twigs, and the dwarf varieties pegged out. Proper attention must be paid to securing the shoots of dahlias as they advance: also, set traps for earwigs, and keep the ground generally well surface-stirred, which disturbs the young of many destructive insects at this season. The soil for Cannas and the tall-growing Lobelias should be rich, and occasional waterings with diluted liquid manure applied. The same may be said of Dahlias, if they are required extra fine.

Annuals.—Make another sowing of hardy annuals for late flowering; thin out and support those advancing into bloom. Continue the planting-out of tender annuals of all kinds. The green dwarf bonnet aster deserves extensive cultivation, both for patches and bedding purposes. Finish planting-out German and ten-week stocks, and sow seed for succession. The London Intermediate stock is excellent for autumn blooming, and often lives over the winter, and flowers very fine in spring. Sow Queen and Brompton stocks late in the month.

Florists' Flowers.—Select a suitable situation, with a moderate bottom-heat for striking pink pipings, which should be commenced very soon, as it is important that they should be strong and well-established before winter. Beds of pansies in bloom will be much benefited by a slight shading: the propagation of these should be immediately commenced. Pinks, carnations, and picotees will require constant attention to tying as they advance: keep the surface soil moved occasionally, and apply water in dry weather. Tulip and Turban ranunculus roots should be taken up and stored in a dry airy place, as soon as the leaves decay. It is important that a stock of plants be reserved for filling up the vacancies caused by the removal of these and other bulbs, as well as the early-flowering annuals; for which purpose, late spring-struck cuttings and some late-sown asters are very applicable: the latter may be sown immediately, and the former looked to as they advance.

Rose Garden.—These will now be advancing into great beauty; go over them frequently, and remove superfluous and imperfect shoots, some of which may be only shortened to induce a later bloom. Remove all wild shoots from the stocks as they appear, and employ timely preventive means for keeping down aphides and other vermin; some of the weaker growing kinds will be benefited by occasional applications of liquid manure. Budding may be commenced as soon as the young wood of the stocks is firm enough; and the propagation of China and other free-rooting kinds commenced without delay.

Herbaceous Garden.—These plants are now coming into successional bloom very fast, and are objects of great beauty and interest where they are well attended to: keep them well secured as the growth advances. Double white and purple rockets require to be taken up and divided every season; and as soon as the best of their flowering is over, the flower-stems should be removed at once, in order to strengthen the roots for division next month. Some strong-growing Salvias should be distributed liberally through the beds and borders of herbaceous gardens: they form very conspicuous objects late in the season. Continue to watch the proper time for propagating the choicest kinds, as in this department that operation cannot be generalised.

Shrubberies.—Pick off the seed vessels from Rhododendrons and Azaleas, and see that none of them want for water, to enable them to perfect their growth.—J. W. C.

CONSERVATORY.

The spring-flowering plants being now nearly over, this house (even under the best of management) will have lost much of its interest, as there is nothing in the way of pot-plants equal to the Camellia, the Azalea, and Acacias, and perhaps Cytisus, for effect in a large Conservatory; and, moreover, the large masses of flowering shrubs, herbaceous plants, and Alpines, now making a gorgeous display about the shrubberies, will all have a tendency to make one's best efforts appear insignificant. However, it will not do to give it up in despair: when the employer is liberal and the gardener ambitious to excel, it is possible even now to make this house very interesting. Quality ought to be the object rather than quantity. Let every plant that is brought in here be a perfect specimen of its kind as far as possible, and standing sufficiently thin to allow every part of it to be seen to advantage. All pit-plants that are not in flower will be by this time either in the other houses making their growth, or nicely arranged in some sheltered and shady situation out of doors, which will give room for the planted-out specimens to make a fine growth and furnish themselves all round. Give all the air possible night and day, that you may get a fine stiff growth on the plants. This will involve a large amount of evaporation, which must be met by a free use of the engine and watering-pot. Insects will now increase with amazing rapidity, if not promptly attended to. Climbers are apt to be overlooked till they have grown out of all order.

STOVE.

The most important operation here will be to get a number of the plants out as soon as possible. The space occupied by the bedding-plants during the last few months might be appropriated this way. All such as grow too tall and weak, by growing in the stove during the summer, will, if taken to another house, kept cooler and rather more dry, make much more handsome and better flowering plants than if left in the stove after the other plants are out. The collection ought to be handled over, and if any require to be potted, let it be done, all nicely arranged for the summer. Every thing here will require water in abundance now, but not indiscriminately done. Some plants will require four or five times the quantity of water that others will, though in equal health. Have a good stock of gesneraceous plants growing luxuriantly; they will be very useful by-and-bye. The temperature here ought for the next three months to range from 70 to 90 deg., with plenty of moisture; only see that the moisture is dried up for an hour or two. At least once in every twenty-four hours ventilation at the top of the house is beneficial, but side air is never necessary and as seldom beneficial in a plant-stove.

GREENHOUSE.

Most of the hard-wooded plants ought now to be in their summer quarters, a shady place out of doors; consequently, this house may be used as a kind of intermediate house for all kinds of soft things to bloom in succession for the conservatory. It should be furnished with a shade, or the sun at this season will evaporate the sap out of the leaves, and make them yellow and drop off; the flowers will also drop off almost as soon as open, if the direct rays of the sun are allowed to act on them. The Epacris and similar plants may be moved to the open air about the middle of the month; only take care that they are not exposed to the influence of direct sun for a fortnight after removal. Some time in July, when they have got hardened a little by exposure, they may be placed in the full sun, and will flower all the better for it; only care should be taken that the sun does not act on the sides of the pits, so as to make it hot; such would destroy the roots on that side and naturally hinder the growth of the plant. To prevent this, the plants may be set in beds of three or four rows, and the outside rows most exposed to the sun have a little bank of ashes or old tan thrown up against them; the tops of the plants will be shade enough for the other rows. Azaleas as they go out of bloom ought to be shifted at once, and placed in a house by themselves, if there is such a convenience; if not, they will do along with the Camellias; both will require to be kept clean and warm till they have made their flower-beds: the difficulty of having the two together is, that the Azalea delights in bright sunshine, while the leaves of the Camellia are liable to suffer from excessive sunlight.

HEATH-HOUSE.

All the soft-wooded quick growing sorts will be much better out of doors now than in any house, only they will require the same precautions to prevent the sun acting on the pits as were suggested for the Epacris. They had better be placed in a shady place for a few days when first taken out, and it would be an advantage to have them placed in a situation where the rays of the sun would be obstructed from them after 12 or 1 o'clock. The young stock cannot be better than in a pit with the light drawn off night and day, except during hot sun and drying winds or heavy rains. Keep the bottoms of the pits saturated with water, and sprinkle the plants over head occasionally in dry weather. The house will now contain only flowering plants, if they are not in Conservatory, and the largest and most valuable plants. Attend well to shading and ventilation, with plenty of nutrition; guard carefully against mildew and green fly; and, excepting a sudden death now and then, all will go on well. R. R.

KITCHEN GARDEN.

Peas.—Continue to sow at the beginning and end of the month; and in addition to the tall varieties previously recommended, Dancer's Monastery may be chosen: its average height is from six to seven feet, prolific, and of good quality. Stick advanced crops; as when allowed to lie on the ground, a slovenly appearance is given to the garden, if otherwise neatly kept. Instead of dosing the pea-crops with water during dry weather, the benefit of which is questionable for the prevention of mildew, the evil may be mitigated to a greater extent by covering the soil between the rows with rotten dung, or the grass from the lawns. *Broad Beans.*—Where the consumption is extensive, sow at the beginning and end of the month. *Dwarf Kidney Beans.*—To allow the plants a sufficiency of space the drills must not be less than two feet apart, and as the plants advance support them, to prevent breakage by wind. *Scarlet Runners.*—A sowing made during the present week will continue to bear till destroyed by frost. *Celery.*—Where space must be economised provide beds four feet wide, which will contain three times the number of plants as the same piece of ground would occupy if planted in single rows. Supply new plantations well with water, to prevent them shooting into flower; and stick among the plants a few green boughs, to modify the intensity of the sun's rays. *Asparagus.*—By the end of the month asparagus cutting should be discontinued; for if carried on to a later period the plants become too much exhausted, but till then keep every shoot cut close to the surface of the bed. *Onions.*—Stir the surface-soil often, to prevent the admission of drought; and regularly thin the plants to three inches apart, with the exception of the silver-skinned, which is to be used for pickling. *Cardons.*—These should be sown at once, if not done last month; and for the mode of procedure *vide* a former calendar. *Rhubarb.*—Do not deprive it of more leaves than is absolutely necessary; as in proportion to their destruction the energy of the root is diminished. *Red Beet.*—So soon as the true colour can be distinguished thin the plants finally; and be careful at all times when destroying weeds not to injure the roots. *Leeks.*—The principal crop should be planted as early in the month as circumstances will admit. Place the plants in rows one foot distant and six inches asunder. The leek is a gross feeder, and requires highly manured soil. *Cauliflowers.* — Sow during the first week in the month for the last crop in the season, which will supply heads during October and November, or on to Christmas if not destroyed by frost. *Endive.*—From the middle to the end of the month sow for the principal crop, as there is then less chance of the plants running into seed. *Carrots.*—I have no doubt that in many cases the entire crop has been eaten by slugs, as they have been in legions infesting the garden during the past spring. The only remedy under such a circumstance is either to prepare another piece of ground, or freshen with the spade the surface of that where they were originally sown, and add to it powdered lime. The month of June is not to be preferred for carrot sowing, but very frequently as good a crop may be obtained as when sown during March or April. *Salsafy* and *Scorzonera* require to be thinned to the distance of eight inches. *Tomatoes* should be kept nailed closely to the wall, and allowed a sufficiency of space in the shreds, as the shoots grow to a considerable size. *Cucumbers.*—The branches require to be regulated often, and kept thin, to admit solar heat freely among the roots. The plan of continual stopping cannot be too strongly repudiated, as it weakens the plant's organism. *Shalot* and *Garlic.*—Whenever the bulbs are fully matured expose them to sunshine for a few days before being tied in bunches. *Chicory* should be sown during the first few days in the month in rows fifteen inches apart, and afterwards thinned to six inches distant. The leaves are valuable for salads during winter. *Cabbage.*—Sow some dwarf variety about the beginning of the month for autumn and winter coleworts. If not already done, plant the red variety for pickling. *Turnips.*—Keep a continued supply by monthly sowings, as they soon get fibry, particularly if the weather is dry. *Savoys, Borecole, Brussels Sprouts,* and *Broccoli.*—Begin earnestly to plant out for autumn and early winter use; allow no ground to remain unoccupied; and if the weather is dry, puddle the roots. Sow early in the month Millar's Late Dwarf, Impregnated White, and Knight's Protecting Broccoli.

HARDY FRUIT.

Strawberries.—So soon as the runners are ready commence the preparation of plants for new plantations, by laying them in small pots. *Peach Trees.*—Continue to remove superfluous shoots, and keep those that are to remain closely nailed to the wall, to give them all the advantage of solar heat. Should any vacancy occur, shorten some convenient young shoot to a few eyes, which will furnish a supply of laterals during the present season. The same method may be adopted where it is desirable to give expansion to the head of young trees. *Vines* on the wall should be thinned and stopped with regularity; and every useless shoot removed, and any diseased leaves, as thrips and red spiders generally attack those first. A. C.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEATH.
Day.	8 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p.m.	10p.m.	
	in. cts.	in. cts									
Apr. 21	29.50	29.56	53	54	52	S. West	gentle	cloudy	cloudy	cloudy	rain
22	29.44	29.53	49	54		N. East	gentle	cloudy	cloudy	fine	rain
23	29.66	29.76	42	62	47	S. Westerly	lively	fine	cloudy	fine	showery
24	29.77	29.78	42	61	50	W., N. West	gentle	fine	sun	fine	dry
25	29.84	29.86	45	54	42	North by East	gentle	cloudy	cloudy	fine	dry
26	29.83	29.70	37	53	50	W., N. East	gentle	fine	sun	cloudy	showery
27	29.65	29.55	33½	52	38	N. by E. by W.	gentle	cloudy	cloudy	fine	dew drops
28	29.59	29.61	32	52	40	N.W., S.W.	gentle	fine	cloudy	fine	dry
29	29.61	29.61	36	51	40	West by North	gentle	cloudy	fine	cloudy	hail
30	29.61	29.61	35	55	43	West by North	lively	fine	sun	fine	hail & rain
1	29.77	29.68	36	52	45	W.byN.,E.byS	varia.	fine	fine	cloudy	dry
2	29.68	29.81	36	57	44	N. Easterly	gentle	fine	sun	fine	dry
3	29.85	29.74	35	52	39	S. West	lively	fine	cloudy	fine	showery
4	29.73	29.67	35	46	39	W.N.W.	lively	cloudy	fine	cloudy	dry
5	29.70	29.72	33	47	42	N. Westerly	lively	cloudy	fine	cloudy	showery
6	29.76	29.86	39	51	45	N. West	varia.	cloudy	cloudy	cloudy	rain
7	29.86	29.71	30	56	48	W., S. West	gentle	cloudy	sun	fine	dry
8	29.83	29.70	43	61	48	S. by West	brisk	fine	sun	fine	showery
9	29.67	29.67	45	60	52	S. by E. by W.	lively	fine	cloudy	fine	dry
10	29.65	29.69	49	67	50	South Easterly	strong	fine	sun	fine	showery
11	29.70	29.77	41	67	56	Variable	v. calm	fine	cloudy	cloudy	dry
12	29.85	30.10	49	56	50	Variable	gentle	haze	cloudy	fine	showers
13	30.20	30.30	45	59	46	North East	gentle	fine	fine	fine	dry
14	30.30	30.30	37	61	42	East	gentle	cloudy	sun	fine	
15	30.30	30.20	33	60	46	North East	gentle	fine	sun	fine	dry
16	30.11	30.04	39	66	51	N. Westerly	lively	fine	sun	cloud	dry
17	30.00	29.98	47	60	52	W. by S. West	lively	cloudy	cloudy	fine	dry
18	29.93	29.88	48	58	46	S. by W., N.	varia.	cloudy	cloudy	fine	showery
19	29.93	30.00	44	59	46	W., N. W.	lively	fine	sun	fine	rain
20	30.20	30.26	40	64	53	N. Westerly	lively	fine	sun	cloudy	dry
21	30.27	30.25	49	60	57	W., N.W.	gentle	cloudy	cloudy	cloudy	

ESTIMATED AVERAGES OF MAY.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.38	29.16	70	33	57

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
57	40.84	48.92

WEATHER AND PHENOMENA.

April 21—Rainy afternoon and evening; 22—Much rain, red streaky clouds about sunset; 23—Lovely till p.m., a shower at 3 o'clock; 24—Heavy clouds, clearing off; 25—Overcast, fine cold night; 26—Vast dew, fine till 3 or 4, cold and raw night; 27—Cold, a scale of ice seen, massy white cumuli; 28—Frost, a snow scud and sleet; 29 and 30—Thunder, hail, and rain, gleams.

LUNATION.—23rd day, last quarter, 6h. 58 m. morn.

May 1—Fine and cool, cumulous compound clouds; 2—Gleams, smoky clouds; 3—Changeable, thunder and hail; 4—Chilly, heavy masses; 5—shower, changeable; 6—Overcast; 7—Fine; 8—Fine, clouds collect at night; 9—Airy, fine lunar halo; 10—Strong wind, hot sun; 11—Brilliant morning, lightning, clouds at sunset; 12—A struggle, shower clouds; 13—Fine cool day; 14—Early clouds, cool p.m.; 15—White frost, fine sunny day; 16—Fine sunny day; 17—Much the same; 18—One prodigious shower, with rich yellow suffusion at sunset, and change of wind; 19—Small showers; 20—Airy fine day; 21—Generally overcast, mild.

LUNATIONS.—New moon, 1st day, 9h. 2m. morning. First quarter, 8th day, 1h. 34m. afternoon. Full moon, 15th day, 8h. 5m. morning.

REMARKS REFERRING TO AGRICULTURE.—Cool and ungenial as the season has been, a fine progress has been made, and the crops, one and all, are improved; the forage plants are beautiful. Wheat bold and strong, and appears to have suffered little, excepting as reported, that on cold clays it is looking somewhat yellow. The rains have fulfilled their duty by a volume in a limited period, and if warm weather take up, the season will be a fine one. J. TOWERS.

Croydon, April 21.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MAY.

Notwithstanding that the weather has proved changeable, with frequent cold winds, vegetation in general has made some progress. In the early part of the month, our accounts in reference to the growing wheats were by no means satisfactory—they having assumed a yellowish tinge in most localities; but a marked improvement has been lately observed in them, and which has given fair evidence of a good forthcoming crop. From most quarters, we learn that barley and oats are looking well. A great difference of opinion exists amongst the majority of farmers respecting the actual quantity of home-grown wheat at this time on hand. That the produce, last year, was barely an average is pretty generally admitted; whilst looking to the sales in particular counties, since the commencement of the year, we perceive that they exhibit a material falling off, compared with those in 1850, during the same period. The immense arrivals of wheat and flour from abroad, and the consequent large sales of the latter article, have, as a matter of course, tended to interfere with the transactions in English produce; nevertheless—and although it is stated that many wealthy growers have still large stocks in their rick-yards—we incline to the opinion that the supply is barely an average one for this season. As to spring corn, especially barley and oats, it is evident that consumption during the next three or four months must fall almost wholly upon foreign qualities; indeed, such is the scarcity in some parts, that farmers themselves are compelled to purchase at the outports.

On the whole, the corn trade has assumed a firmer tone, and prices of most articles have had an upward tendency. The imports from abroad have continued on an extensive scale, although it is tolerably well understood that they have, in most instances, entailed a loss upon the importers. The present inquiry is—will these arrivals continue large during the remainder of the year? It is quite clear to us that—such is the state of affairs on the continent—whether English merchants invest their capital in foreign agricultural produce, or whether they withhold all means of import, the surplus produce must of necessity come here. Of course, the more remunerative the price may be in the United Kingdom, the greater will be the shipments; yet we fear that the producers will not feel disposed to wait for certain changes in our markets, as they might continually prove unfavourable to their interests. The natural inference is, therefore, that we shall be inundated with foreign "bread-stuffs," to the partial exclusion from consumption of home-grown produce. It is barely possible that France may have shipped beyond her legitimate means, notwithstanding that a large portion of the flour received here for some time past has been manufactured from Polish Odessa and other foreign wheats; but any falling off in the supply from that quarter will be more than made good by the United States, where the holders, at the date of our last advices, had lowered their pretensions to a shipping, or paying point. This fact is calculated to shake confidence in the future. With the exception of some of the South American and West India markets—where the duties are very high—America has no other market but ours to forward large quantities of produce to. The progress of agriculture in France—under, be it observed, the strict principles of protection—could not be more forcibly illustrated than by the following statement of the quantities of wheat and flour imported into the United Kingdom from that country during each of the last twenty years:—

Year.	Wheat. Quarters.	Flour. Cwts.
1839	278,182	115,502
1840	48,370	1,070
1841	147,966	161,071
1842	469,707	164,690
1843	3,118	48
1844	44,871	13
1845	32,133	12,866
1846	71,615	7,558
1847	144,913	120,212
1848	216,524	362,202
1849	451,331	1,006,258
1850	595,355	1,925,175

Should the weather prove fine, we may anticipate a very large crop of hay this season. The grass is remarkably thick upon most good lands. The increasing abundance of green food has tended to depress the value of meadow-hay, yet it still remains much higher than at any period during the last three years. Large quantities of straw have been disposed of; but the demand for clover has proved inactive.

The sales of colonial wool in the metropolis have drawn together a large number of buyers from the manufacturing districts; but those from the continent have been small. Nearly the whole of the parcels submitted—about 26,000 bales—have been disposed of at a decline in the quotations of 0½d. to 1d. per lb. Letters from Sydney state that wool was falling in value. The current rates paid for parcels now on passage were—superior clips, 1s. 4d.; fair to good, 1s. 2d. to 1s. 3¼d.; low to middling, 10½d. to 1s. 1½d.; grease, 5½d. to 6¾d.; and scoured, 1s. 2d. to 1s. 6d. per lb.

Large imports of foreign stock having taken place, and the various markets being well supplied with home-fed beasts and sheep, the cattle trade has ruled inactive, and prices have been with difficulty supported. Generally speaking, our accounts are favourable as respects depastured and stall-fed stock.

Immense quantities of potatoes, in excellent condition, have reached the metropolis from various districts, they having been estimated at nearly 10,000 tons. This is by far the largest supply ever received in May, and proves the great abundance of last year's crop. From the extended breadth of land planted this year in Essex, Kent, &c., and more particularly in Scotland, we may calculate upon even larger supplies, should the season prove favourable. From all that we can learn, the crop has paid remarkably well. The importations from France, Holland, &c., have been extremely small—under 500 tons.

The corn trade in Ireland and Scotland has undergone very little change. Fine wheat, barley, oats, and oatmeal have sold at full rates of currency; but the middling and inferior kinds have commanded very little attention.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

An immense influx of visitors—consequently a great increase in the consumption of meat—having been naturally anticipated from the holding of the Great Exhibition, Smithfield has been unusually well supplied with each kind of stock; whilst the arrivals of slaughtered meat up to Newgate and Leadenhall have materially increased. The result, however, up to the present time, has been one of disappointment. Instead of activity, extreme dulness has been the leading features of the trade; and prices, as a consequence, have tended downwards. The recourse, by many leading graziers, to a more natural, and, to our way of thinking, more wholesome system of feeding, has been very perceptible during the whole of the month. Necessity has possibly compelled most of the small feeders to desist from purchasing their usual quantities of oil-cake; but we have no hesitation in saying that the present system will pay them much better. The butchers admit that both beasts and sheep have "died" remarkably well, and further, that their average profits have been most satisfactory. The supplies of stock upon most farms are still large, and very few losses have been sustained during the whole of the present year. The stock fairs are now beginning to attract attention; but, from present appearances, we conceive that prices will not rule very high.

The total supplies of English and foreign stock exhibited in Smithfield have been as under:

	Head.
Beasts	19,464
Cows	460
Sheep and lambs	133,362
Calves	1,855
Pigs	2,780

COMPARATIVE SUPPLIES.

	May, 1848.	May, 1849.	May, 1850.
Beasts	16,541	16,320	16,468
Cows	491	450	456
Sheep and lambs	102,230	115,340	128,910
Calves	2,087	1,555	1,740
Pigs	2,581	2,193	2,258

Forming the leading portions of the above, 10,300 beasts have arrived from Norfolk, Suffolk, Essex, and Cambridgeshire, 2,650 from other parts of England, and 2,550 from Scotland.

The foreign imports into London have been as follow:

	Head.
Beasts	1,917
Sheep	5,494
Lambs	56
Calves	1,420
Pigs	307
Total	9,214
Same month in 1850	6,060
,, 1849	5,465
,, 1848	7,904
,, 1847	6,275

From the Isle of Wight about 1,800 lambs have come to hand. The supply from Ireland has been confined to 58 pigs.

COMPARATIVE PRICES IN SMITHFIELD.
(Per 8lbs., to sink the offal.)

	May, 1848.				May, 1849.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef, ...from	3	0 to	4	2 ..	2	4 to	3	8
Mutton	4	0 to	5	2 ..	3	4 to	4	0
Lamb	4	8 to	6	10 ..	4	10 to	6	0
Veal	3	10 to	4	10 ..	3	4 to	4	0
Pork	4	0 to	5	0 ..	3	2 to	4	2
	May, 1850.				May, 1851.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef, ...from	2	6 to	3	6 ..	2	4 to	3	6
Mutton	2	10 to	4	0 ..	2	6 to	4	0
Lamb	4	0 to	5	4 ..	4	8 to	5	10
Veal	3	0 to	3	6 ..	3	0 to	3	8
Pork	3	2 to	4	0 ..	2	8 to	3	8

In Newgate and Leadenhall the prices during the month have ranged as follow:

	s.	d.	s.	d.
Beef ....from	2	2 to	3	4
Mutton	2	6 to	3	8
Lamb	4	6 to	5	6
Veal	3	0 to	3	10
Pork	2	6 to	3	8

REVIEW OF THE CORN TRADE

DURING THE MONTH OF MAY.

The demonstration at Drury Lane, in the beginning of the month, in favour of a moderate extent of protection to British industry, afforded a striking proof of the feeling entertained on the subject; but so long as the Whigs remain in power, it would be vain to expect that any practical good will be done for the agriculturist. All parties appear, however, to have come to a tacit understanding to allow matters to remain as they are to the end of the session; meanwhile it behoves those connected with the land to use their best endeavours to prepare for the coming election, as it is perfectly evident that so long as the present Government retain the reins of office, the interest of the farmer will be sacrificed to propitiate the Manchester school of politicians.

The importations of foreign grain, &c., into the United Kingdom, though not quite so large as previously, have nevertheless been sufficiently extensive to prevent any material rally occurring in prices of English wheat. The arrivals from abroad during the month ending the 5th instant have consisted of 337,754 qrs. wheat, 105,502 qrs. barley, 100,259 qrs. oats, 1,899 qrs. rye, 6,324 qrs. peas, 17,120 qrs. beans, 119,755 qrs. maize, and 416,509 cwts. flour. Since then, further supplies have come to hand; and though the receipts have, within the last eight or ten days, fallen off, there is reason to believe that the check in the imports will be only temporary. A considerable quantity of wheat and Indian corn is known to be on passage from the Black Sea, the Mediterranean, and the Sea of Azoff; and though shipments from the Baltic have not been very extensive of late, still most of the vessels which have gone out have been chartered, and are being loaded with wheat or other grain, notwithstanding the discrepancy between our prices and those current in the north of Europe. We are therefore inclined to think that there will be no lack of supplies, and that the value of breadstuffs will continue low in this country, unless the seasons should prove unpropitious—an event which might benefit speculators, but which the farmer could certainly not be profited by.

The weather was cold and harsh in the early part of the month, and no change for the better occurred until the 21st, since which period a considerable improvement has taken place. The want of genial warmth during the spring and the frequent occurrence of sharp night frosts, caused some uneasiness respecting the crops; and the slight advance which prices have undergone must be attributed to that feeling. We are happy to say, however, that from all the information we have been enabled to collect, we have come to the conclusion that no serious mischief has resulted; and the wheat plant, which at one time had a somewhat yellow, unhealthy appearance, has already in a great measure recovered. At this early period of the season it would be vain to offer an opinion on the probable result of the next harvest; but it is satisfactory to learn that practical farmers speak encouragingly of the prospects thus far as regards wheat.

The sowing of spring corn was not completed until somewhat after the usual time, owing to the interruptions in March and April, by the then prevalence of wet weather. Barley and oats are consequently backward in most parts of the kingdom, and the result is regarded with some degree of doubt. Beans generally look well, but peas have a less promising appearance.

The auspicious change which has taken place in the weather has, however, come at the right time, and should the summer prove tolerably propitious, we may hope for a good return of all the products of the soil.

The grass lands have improved amazingly within the last week or two; and, though the hay crop will probably be late, it is likely to be heavier than was at one period expected.

The wheat plant will come into ear somewhat after the usual time in ordinary average seasons: favourable weather during this period is much to be desired, as the future productiveness of the crop is greatly dependent on the prevailing atmospherical influences during that stage of its growth; the next few weeks will therefore be watched with much anxiety.

Though, as we have already remarked, some little improvement has taken place in the value of wheat since our last, the trade has not been by any means lively—the constant pressure of foreign on all the leading markets having checked the upward movement. The future range of quotations will now be almost wholly regulated by the character of the season; and as that cannot be foreseen, predictions would be worse than useless. The general impression is, however, in favour of a moderate advance; and the reasons assigned for this belief are not altogether illfounded. The short yield of the last crop has never been questioned, and it is therefore concluded that the farmers hold less than usual at the corresponding period of the year; this is, it is true, only a presumption, but it is nevertheless likely to be correct. Anything threatening injury to the growing crop would consequently have an immediate influence on the minds of both buyers and sellers, more particularly if the importations from abroad should, as many are inclined to believe will be the case for a time, be less abundant than they have been hitherto. That the low value of wheat as compared with that of other kinds of grain, is causing it to be employed for purposes it would not otherwise be used for, is not improbable; and that the consumption of bread will be increased by the influx of visitors during the summer to view the Exhibition cannot be questioned. These appear, at all events, to afford sufficient reason to conclude that, if no advance occurs, prices cannot well fall much below their present level; and if the large millers once felt convinced of that, they would be very likely to add to their stocks so as to be prepared to reap the advantage of any possible rise; this alone would suffice to give a healthy tone to business.

Stocks of spring corn have evidently been reduced into a very narrow compass, as well in this country as in Scotland and Ireland; and though the value of both barley and oats has been gradually advancing for some time past, present appearances are in favour of a further enhancement. Large as have been the importations of these articles from abroad, there has been no accumulation at any of the leading markets; proving beyond doubt what we stated at harvest time, viz., that the shortness of the wheat crop would not be compensated for by a better yield of other kinds of grain.

In giving our usual retrospect of the operations at Mark Lane during the month, we have no new feature to notice, matters having remained in much the same position as before. The arrivals of English wheat into the port of London have been very small; and the increase expected, and which generally takes place after the sowing of spring corn has been completed, has not been realized; indeed, the receipts have been less this month than they were in April—the supply having scarcely averaged 2,400 qrs. per week. The insignificance of the home supply has, however, been scarcely felt, as the millers have had an ample quantity of foreign wheat, both old and new, from which to select; the advance of 1s. to 2s. per qr. established at several of the leading provincial markets since the close of last month has therefore not been responded to in London, and quotations have scarcely varied. An attempt was made on the 12th inst. to raise prices, but buyers showed no symptoms of being in any immediate want, and refused to pay higher rates than before. Since then the tendency has been rather the other way, business being decidedly slow on the succeeding Monday, though the endeavour to establish an improvement was abandoned. The auspicious weather experienced since the 21st May has not been altogether without influence, and within the last week it has become difficult to effect sales of the commoner kinds of English wheat at former terms. The arrivals of foreign wheat into the port of London have amounted to upwards of 80,000 qrs., three-fourths of which quantity came to hand during the first fortnight in May. This supply has been quite sufficient to replace what has been taken for consumption, and stocks at this port have not diminished. A considerable number of country buyers have visited our market from time to time; but finding prices higher than they expected, have returned home without purchasing extensively. The week in which most business was done was that ending on the 10th inst.; the transactions previously and since having been on a retail scale. In quotations scarcely any change has occurred; Polish Odessa, and similar qualities, have sold at prices varying from 35s. to 38s.; moderately good parcels of Baltic, French, and Hamburg red wheat at 38s. to 40s.; Rostock at 40s. to 43s., and Danzig at from 42s. to 48s. per qr., according to quality, weight, and condition.

The arrivals from ports lying east of Gibraltar, off Falmouth and Queenstown, have been moderate since our last, and most of the cargoes which have come forward have been easily placed, principally for Irish account. Egyptian wheat has sold readily at 24s. to 25s., Polish Odessa at 34s. to 35s., and Romelia at 30s. per qr., cost, freight and insurance.

The free-on-board offers from the Baltic have been at too high rates to tempt our merchants to purchase, and comparatively little business has been done in this branch of the trade.

The top price of town-manufactured flour has undergone no change, nor have fresh-ground country marks been offered cheaper than before. The sale of home-made flour has been a good deal interfered with by the continued influx of French; and the millers have at length deemed it expedient to endeavour to draw the attention of Government to the unfairness of permitting the free import of the manufactured article. Meetings have been called in different parts of the country to discuss the matter, to petition Parliament to place a moderate duty on flour, &c.; but we fear that this will be followed by no substantial benefit until the present Ministry be got rid of altogether. The total arrival of flour from abroad at this port during the month has amounted to 37,680 sacks and 8,106 barrels; the former almost all from France, and the latter from America. Really fresh qualities have sold on similar terms as before; the best marks of French being still worth 30s. to 32s. per sack. Doubtful descriptions have, on the other hand, been exceedingly difficult of disposal, and a large proportion of the stock now on the wharves consists of secondary and inferior sorts—likely to go out of condition now that the weather has become warm. Such qualities have been offered at low and irregular prices, which has had a very depressing influence on the market.

Prices of barley have not varied materially since our last; supplies of English have almost ceased to come forward, the arrivals coastwise having only amounted to a few hundred quarters per week. The malting season having, however, closed, there has been little demand for the finer sorts; and in the absence of business of any importance, quotations have remained precisely as before. In the early part of the month the receipts of this grain from abroad were liberal; within the last week or two a material falling off has, however, taken place in the arrivals; and as the demand for grinding qualities is likely to increase rather than diminish, holders have manifested no anxiety to press sales. The greater part of what has come forward has been either taken at once from on board ship by the large dealers, or been landed on account of the importers, there has consequently been no pressure; and, unless the supplies are followed up, a further improvement in prices does not appear improbable. Light 48lbs. to 50lbs. qualities have found buyers at 20s.; and the heavier sorts at 21s. up to 23s. per qr. These rates will scarcely pay the importers, as very high prices have lately been given on the Continent.

The transactions in malt have not been extensive; but the firmness in the barley market has had more or less influence, and the value of the first-named article has rather crept up since our last, good samples of Norfolk and Suffolk pale malt having realized 50s. to 53s., and fine Ware up to 56s. per qr.

The arrivals of oats of home-growth have been scanty in the extreme; and the supply of about 100,000 qrs. from foreign ports, received since the close of April, has failed to produce the slightest reaction in prices. The fact is that the large dealers had allowed their stocks to become reduced to so low an ebb that they were unable to hold off any longer; and notwithstanding the magnitude of the arrivals from abroad the greater part has already passed out of first hands. In addition to what has been taken by the local buyers, purchases to some extent have been made by country dealers and consumers; and, unless we have further supplies, the market will soon again become bare of good corn. Our own growers appear to have scarcely sufficient on hand to provide for their wants. From Scotland a few shipments may be expected; but, as prices are relatively higher there than in the English markets, the quantity cannot be large; the same may be said with regard to Ireland, oatmeal being nearly as dear there as the common sorts of flour. It appears, therefore, that we shall have to depend in a great measure on the continent for our supplies up to harvest; and as stocks are not by any means heavy at any of the near ports, we can scarcely calculate on again receiving so large an accession to our stocks as that afforded by the late arrivals. Under these circumstances some further rise in prices seems more probable than any decline, and the usual spring shipments from Russia, which generally reach us in the latter end of June and the beginning of July, are likely to come to a good market. Moderately good feed oats have lately been selling at 18s. to 20s., and fine at 20s. to 22s., Scotch 22s. to 23s., and potato 24s. up to 26s. per qr.

English beans have come sparingly forward, whilst the rise in the value of oats has caused an increased demand; the tendency of prices has consequently been upwards, and there has been a good deal of inquiry for Egyptian and other foreign sorts. Good Alexandrian beans on the spot have realized 22s. per qr., and for cargoes on passage 20s. to 21s. per qr., cost, freight, and insurance, has been freely paid.

Peas have excited less attention than might have been expected, considering the upward movement in the value of all other articles suitable for feeding purposes. There are still fair stocks of foreign in granary at this port, and any material advance is therefore scarcely to be calculated on.

In Indian corn on the spot there has been very little doing; few of the shipments are directed to this port, and we have scarcely any on the market, the consumption of the article being almost entirely confined to Ireland. A considerable proportion of what is used there is, however, imported by Greek merchants resident in London; and a large business is therefore done here in free-on-board cargoes. The arrivals this month, off the coast, from the Black Sea, &c., have not been important; and those cargoes not previously placed have been readily disposed of to Irish buyers at former rates, say 31s. per qr., cost, freight, and insurance, for Galatz, and corresponding terms for other descriptions. A few vessels have arrived laden with this article from the south of France and from Portuguese ports, for which about 28s. per qr. has been obtained.

We shall devote the remainder of our space to a brief notice of the alterations which have taken place at the principal foreign corn markets during the month, deeming it necessary that our readers should be put in possession of the changes which may occur from time to time in the position of affairs abroad.

The weather, which in the early part of the spring was more favourable on the Continent than in this country, appears to have become cold and changeable, and the first fortnight in May has not generally been favourable, in the north of Europe, for the growing crops. Holders, who were previously sufficiently disposed to speculate on higher prices, were not slow to take advantage of the circumstance further to raise their pretensions; and the value of both wheat and spring corn has risen at the leading foreign ports since the end of April.

At Danzig, the advance on wheat has amounted to about 2s. per qr., and a considerable amount of business appears to have been done there at the enhancement. Some of the purchases are reported to have been on British account; but we believe that the greater part of the supplies had been bought up by the local merchants and speculators, in expectation of an increased English enquiry later in the season. Be this as it may, prices have certainly been run up there to a height not warranted by the state of affairs here. The most recent advices inform us that as much as 41s. to 42s. had been paid for good mixed wheat, of 62 to 63lbs. weight: for fine mixed, 43s. per qr. had been refused, the sellers demanding 45s. per qr. free on board. Vessels had become rather scarce. The last charters closed had been at 3s. per qr. for London, 2s. 6d. to 2s. 9d. for ports on the east coast, 3s. to Perth, and 4s. to 4s. 6d. for the west coast of England and Ireland. The prices named above are out of all proportion to quotations in our markets; and it follows, therefore, that the consignments which have lately been made from the Baltic to this country must be attended with loss, if quotations on this side do not move upwards.

At Konigsberg, equally high rates (allowing for the difference in quality) had been paid for wheat; but there had not been so much doing at the last as at the first-named port. The supplies of spring corn brought forward had proved inadequate to the demand. A good many orders for the purchase of barley and oats on British account having been received, for the former article 17s. to 18s., and for the latter 14s. 6d., per qr. free on board had been readily obtained.

Stettin letters of the 22nd inst. inform us that a large amount of business had been done there in wheat, as well as in other articles, and that enhanced terms had been realized. Purchasers of wheat had had to pay 35s. to 36s. for common red Stettin weighing 60 to 61lbs., 36s. 9d. for Pomeranian of 61½lbs. weight, 36s. 9d. for 62lbs. Uckermark, and 37s. to 39s. for mixed to fine mixed Polish. Barley had come forward sparingly, and quotations were then 20s. 3d. to 20s. 8d. per qr. free on board, the weight being 52 to 52½lbs. per bushel.

At Rostock, where prices of wheat have all along been high, holders had still further raised their pretensions, owing, firstly, to the shortness of the supplies from the growers; and further, to the somewhat unfavourable weather experienced about the middle of the month. The most recent accounts from thence are dated 22nd inst. For some days previous, wheat had been in lively request, and farmers' samples, weighing 61 to 62lbs. per bushel, had realized equal to 37s. 6d. per qr. free on board. Barley had likewise been much sought after, and the few parcels brought to market had been placed without difficulty at 19s. per qr. The high value of oats had failed to draw supplies, and all the accounts from the North of Europe agree in stating that stocks of that article are nearly exhausted.

The advices from Stralsund, Wismar, Greifswald, and Anclam are of a similar character to those from Rostock, and quotations are much the same at the places named as those given above. At the near ports prices have also been run up materially since the beginning of the month, and business with the continent must at present be attended with considerable hazard.

Hamburg letters of the 23rd May state that the market had been nearly cleared of wheat, and that barley and oats had become very scarce; business had consequently for some time been principally confined to free on board purchases at outports. Upland wheat on the spot, weighing 61lbs. per bushel, was then held at 38s. 6d., and Wahren of 61½lbs. weight at 40s. per qr. free on board. Good qualities 61½lbs., to be shipped from Holstein, had been offered at 38s. 3d., and 60 to 60½lbs. from Denmark at 35s. 3d. to 35s. 9d. per qr. free on board. Saale barley on the spot, weighing only 49½lbs., had realized 22s. 6d., and for shipment from the Danish Islands 21s. to 22s. per qr. had been paid. Oats from the same destination had likewise sold at very high terms, say 16s. 9d. to 17s. 3d. per qr. for 38 to 39lbs. feed.

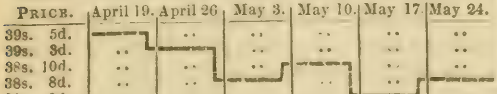
The value of wheat has for some time past been relatively higher in Holland and Belgium than in the British markets, and comparatively little has been shipped from the Netherlands to this country. So long as oats were obtainable at anything like moderate rates, a good many purchases were made at the different Dutch ports on English account; latterly, however, the value of that grain has risen at Groningen, Emden, &c., to a point deemed too high by our buyers, and shipments have fallen off.

From France we learn that the deliveries of grain from the growers had at length begun to fall off, and that the enhanced terms demanded for the raw material had caused flour to move upwards in value. At Paris a rise of about 2 francs or 1s. 8d. per sack had taken place in about a fortnight; and at some of the ports on the coast, where the stocks were less extensive than in the capital, the advance had been greater. This would appear to indicate a decrease in the supplies from thence. Most of the oats brought forward had been bought up on English account at high prices, and our correspondents imply that great difficulty would be experienced in obtaining any further quantity, of importance, from thence.

From Italy we learn that the weather had been auspicious for the crops, and that an early harvest was calculated on. Stocks of old wheat having, however, been reduced into a narrow compass, and the arrivals from the Black Sea, &c., having been moderate, former rates had been supported. Letters from Leghorn, dated May 17th, state that little or no change had occurred in quotations of either wheat or Indian corn, and that the purchases for export had not been extensive. The latest advices from Marseilles inform us that the inquiry for wheat had improved there, and Barletta, which a week before had been freely offered at 33s. 9d., had risen to 34s. 3d. per qr. free on board. Of Polish Odessa but few parcels had come forward, and prices were relatively higher there than with us.

We have advices of recent dates from the United States and Canada. The demand for flour for home use, and for shipment to California, appears to have been sufficiently extensive at the principal markets in the States to support prices, and though compatively little had been done in the article for export to Europe, there had been no pressure. At New York, on the 13th of May, good shipping brands of Western Canal flour were worth 4 d. 6¼ c. to 4 d. 12½ c. per brl., and other qualities proportionate rates. Indian corn had been in good request, and its value had tended upward: yellow was then quoted 60 to 63 cents, and white 58 to 60 cents per bushel. Freight for flour to Liverpool was 1s. 3d. to 1s. 6d., and for grain 4¼d. to 4¾d. per bushel. For London very little was being shipped.

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING MAY 24, 1851.



IMPERIAL AVERAGES.

For the last Six Weeks.

	Wheat.		Barley.		Oats.		Rye.		Beans		Peas.	
Week Ending:	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
April 19, 1851..	39	5	24	5	17	5	24	7	26	10	25	9
April 26, 1851..	39	3	24	4	17	10	24	2	26	9	25	5
May 3, 1851..	38	8	24	3	18	3	23	11	27	9	25	4
May 10, 1851..	38	10	24	4	18	8	24	7	27	10	25	11
May 17, 1851..	38	2	24	2	18	11	25	9	28	10	27	2
May 24, 1851..	38	8	24	1	19	5	24	7	29	2	26	1
Aggregate average of last six weeks	38	10	24	3	18	5	24	7	27	10	25	11
Comparative avge. same time last year	38	4	22	4	15	3	21	0	24	8	25	0
Duties........	1	0	1	0	1	0	1	0	1	0	1	0

SEED MARKET.

Friday, May 30.

As the season for sowing is now closed, Clover is offering at reduced—in many instances at very irregular—prices, without finding buyers. Canary firm, and quite as dear as last week. All other articles are very dull.

Duty was paid on the following quantities of foreign Cloverseed up to the 24th inst.:

	1851.	1850.
London	88,582	54,203
Liverpool	7,981	7,682
Hull	37,913	23,139

Stock in bond, 8,832 cwt.

BOROUGH HOP MARKET.

Friday, May 30.

The accounts from the plantations, in Kent and Sussex, are to the effect that the bine has made considerable progress this week. Our market, however, is firm for all fine hops, at full currencies.

Mid and East Kent pockets, per cwt.	86s. to 140s.
Weald of Kent do.	74s. to 86s.
Sussex do.	65s. to 82s.

POTATOES.

Borough and Spitalfields.—Friday, May 30.

The arrivals of Potatoes this week have been very large for the time of year; but their condition is falling off. All kinds are excessively dull in sale, at further depressed currencies. From the 28th April to the 24th instant 6,175 tons were weighed by the City meters. The quantity weighed from the 1st of August, 1850, to the 28th of April last was 48,500 tons. From Dordt we have received 71, and from Rotterdam 422 bags. Present rates as under:—

York Regents, per ton	50s.	to	90s.
Lincolnshire do.	50s.	to	70s.
Scotch do.	70s.	to	80s.
Do. cups	65s.	to	80s.
Do. Dahlias	50s.	to	60s.
Common whites	50s.	to	60s.
Wisbeach and Cambridge	60s.	to	80s.
Kent and Essex Regents	55s.	to	80s.
French whites	50s.	to	55s.

WOOL MARKET.

Friday, May 30.

The public sales of colonial Wool have been well attended by buyers, this week, and nearly the whole of the parcels offered have been sold at the opening prices. By private contract, we have sellers on lower terms, with little or no inquiry. This week's imports are 670 bales from Adelaide, 1,423 from Portland Bay, 1,700 from Port Philip, and 2,200 from Sydney.

END OF VOLUME XXXIV.

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